APPENDIX A: MARINE HIGHWAY DEFINITION SOURCES

The references from the ECHMHI Request for Proposals, the statute that authorizes the short sea transportation program (referred to by USDOT as the Marine Highway Program), and the Marine Highway Program regulation as it appears in the Code of Federal Regulation were used to define the term "Marine Highway" for this study.

From the ECMHI RFP

The Department of Transportation (DOT) desires to expand the use of the Nation's inland, coastal and intracoastal waterways in transporting passengers and freight (via containers or wheeled technologies). The goal is to reduce congestion on landside corridors, lower road maintenance and repair costs, and to reduce greenhouse gas emissions and oil consumption.

From CFR Title 46, Chapter Ii, Subchapter K, Part 393: America's Marine Highway Program (excerpts. emphasis added)

393.2 - Definitions.
For the purposes of this part:

. . . . . .

(c) *Coastwise Shipping Laws.* Laws, including the Jones Act, as set forth in Chapter 551 of Title 46, United States Code.

. . . . . .

(f) *Domestic Trade.* Trade between points in the United States.

. . . . . .

(h) *Marine Highway Corridor.* A water transportation route that serves as an extension of the surface transportation system that can help mitigate congestion-related impacts along a specified land transportation route. It is identified and described in terms of the land transportation route that it supplements, and must, by transporting freight or passengers, provide measurable benefits to the surface transportation route in the form of traffic reductions, reduced emissions, energy savings, improved safety, system resiliency, and/or reduced infrastructure costs. Routes that cannot relieve landside congestion (i.e.; those to/from islands) are not eligible for designation under this program. In addition to "Corridors," prospective sponsors can recommend Marine Highway "Connectors" and "Crossings" for designation as described in paragraphs (h)(1) and (h)(2) of this section:

> (1) Marine Highway Connectors are routes that will provide substantial linkages to or between the larger corridors, and serve, in conjunction with a corridor, to move freight and/or passengers into, out of or within a region.
>
> (2) Marine Highway Crossings are routes that provide relief to congested border crossings, bridges, and tunnels or offer a shorter route than the landside alternative. Although they may not parallel a corridor or connector, crossings may provide relief to a corridor or connector, or to local or regional passenger and freight transportation systems. Crossings may include cross-harbor and inter-terminal passenger and/or freight services.

(i) *Marine Highway Project.* A new Marine Highway service, or expansion of an existing service, that receives support from the Department and provides public benefit by transporting passengers and/or freight (container or wheeled) in support of all or a portion of a Marine Highway Corridor, Connector or Crossing. Projects are proposed by a project sponsor and designated by the Secretary under this program.

(j) *Marine Highway (or Short* Sea Transportation): The carriage by vessel of passengers and/or cargo (intermodal containers, trailers, car floats, rail ferries and other cargoes loaded by wheeled technology) that is loaded at a port in the United States and unloaded either at another port in the United States, or that is loaded at a port in the United States and unloaded at a port in Canada located in the Great Lakes-Saint Lawrence Seaway System, or loaded at a port in Canada located in the Great Lakes-Saint Lawrence Seaway System and unloaded at a port in the United States. For the purposes of this specific program, routes and services that do not offer potential relief to a landside transportation route (i.e.; to/from islands) do not fall within this definition.

From PL 110-140 - Energy Independence and Security Act of 2007
(excerpts. emphasis added)

``Sec. 55605. Short sea transportation defined

``In this chapter, the term `short sea transportation' means the carriage by vessel of cargo--
``(1) that is--
``(A) contained in intermodal cargo containers and loaded by crane on the vessel; or
``(B) loaded on the vessel by means of wheeled technology; and
``(2) that is--
``(A) loaded at a port in the United States and unloaded either at another port in the United States or at a port in Canada located in the Great Lakes Saint Lawrence Seaway System; or
``(B) loaded at a port in Canada located in the Great Lakes Saint Lawrence Seaway System and unloaded at a port in the United States.''.

* * * * *

``Sec. 55601. Short sea transportation program

``(a) Establishment.--The Secretary of Transportation shall establish a short sea transportation program and designate short sea transportation projects to be conducted under the program to mitigate landside congestion.
``(b) Program Elements.--The program shall encourage the use of short sea transportation through the development and expansion of--
``(1) documented vessels;
``(2) shipper utilization;
``(3) port and landside infrastructure; and
``(4) marine transportation strategies by State and local governments.

``(c) Short Sea Transportation Routes.—The Secretary shall designate short sea transportation routes as extensions of the surface transportation system to focus public and private efforts to use the waterways to relieve landside congestion along coastal corridors. The Secretary may collect and disseminate data for the designation and delineation of short sea transportation routes.

``(d) Project Designation.--The Secretary may designate a project to be a short sea transportation project if the Secretary determines that the project may--
``(1) offer a waterborne alternative to available landside transportation services using documented vessels; and
``(2) provide transportation services for passengers or freight (or both) that may reduce congestion on landside infrastructure using documented vessels.

APPENDIX B: SELECT LITERATURE FOR STUDY OF THE M-95 CORRIDOR*

PRIMARY SOURCE DOCUMENTS **

- America's Marine Highway – 2011 (USDOT)
- American Marine Highway Design Project – 2011 (Maritime Administration)
- Application for Designation of the I-95 Marine Highway Corridor – 2010 (I-95 Corridor Coalition)
- Bi-State Domestic Ferries Study – 2006 (PANYNJ)
- Dual Use Ships for American Marine Highway – 2011 (US Navy)
- Evaluation of Environmental and Social Impacts and Benefits of Shortsea Shipping in Canada – 2008 (Transport Canada)
- Expanding Short Sea Shipping in California – 2010 (Friends of the Earth)
- Four Corridors Case Studies of Short Sea Services – 2006 (USDOT)
- High Speed Ferries and Coastwise Vessels – 2003 (Center for the Commercial Deployment of Transportation Technologies)
- Long Island Sound Waterborne Transportation Plan – 2004 (New York Metropolitan Transportation Council)
- Marine Highway System – 2010 (George Mason University/RITA)
- North American Marine Highways – 2010 (National Cooperative Freight Research Program/TRB)
- Operational Development of Marine Highways to Serve the Pacific Coast – 2008 (CCDoTT)
- Potential Hub-and-Spoke Container Transhipment Operations in Eastern Canada for Marine Movements of Freight – 2008 (Transport Canada)
- Preferences for Alternative Short Sea Shipping Opportunities – 2011 (Institute of Transport and Logistics Studies)
- Short Sea and Coastal Shipping Options Study- 2005 (I-95 Corridor Coalition)
- Short Sea Developments in Europe: Lessons for Canada – 2009 (North American Transportation Competitiveness Research Council)
- Short Sea Shipping on the East Coast of North America – 2006 (Transport Canada)
- Short Sea Shipping Probability Study – 2005 (Port Canaveral, Maritime Administration)
- Transport Short Sea Shipping Vision – 2006 (Ron Silva, Westar)
- TRB Panel: Military Uses of the Marine Highway – 2011 (Weisbrod)

OTHER PRIMARY SOURCES **

AMH PROPOSALS

- AMH I-95 Corridor Service Project – 2010 (Port of New Bedford, Maryland Port Authority, Port Canaveral)
- Atlantic and Gulf Coast Short Sea / Feeder Service – 2010 (Ports of Galveston, South Carolina State Ports Authority)
- New Jersey Marine Highway Platform – 2010 (New Jersey Department of Transportation)

PRESENTATIONS

- Development of a New Marine Highway Vessel Design Utilizing European Technology & Collaboration – 2011 (Mark Yonge, Intermodal Marine Lines)
- Dual Use Ships for American Marine Highway – 2011 (Jon Kaskin, US Navy)

OTHER USEFUL SOURCES ***

REPORTS

- America's Deep Blue Highway – 2008 (Institute for Global Maritime Studies)
- AMH Policy Alternative – 2011 (Henry Marcus)
- Comparison of U.S. and Foreign-Flag Shipping Costs – 2011 (Maritime Administration)
- Cross Harbor Freight Program (EIS underway) – 2011 (PANYNJ)
- Emissions Analysis of Freight Transport Comparing Land-Side and Water-Side Routes – 2005 (USDOT)
- Environmental Implications of Trucks, Trains, Ships, and Planes – 2007 (Air and Waste Management)
- Marine Highway System Evaluation Model – 2010 (CCDoTT)
- Multi-Client Port Access Project – 2003 (I-95 Corridor Coalition)
- New York State Canal System: Modern Freight-Way – 2010 (NYERDA/NYSDOT)
- Plan 2035: The Regional Transportation Plan for Northern New Jersey – 2007 (NJTPA)
- Restructuring the Maritime Transportation Industry: Global Overview of Sustainable Development Practices – 2007 (Transport Quebec)
- Short Sea Shipping: Barriers, Incentives and Feasibility of Truck Ferry – 2009 (MIT)
- Short Sea Shipping: US Team Visit to Germany – 2010 (George Mason University)
- Short-Sea Vessel Service and Harbor Maintenance Tax – 2005 (Short Sea Shipping Cooperative)
- Westar Transport Short Sea Shipping Vision – 2006 (Ron Silva) project

PPT, TESTIMONY, DATA SOURCES

- AMH Policy Alternative – 2011 (Henry Marcus, MIT)
- Comments filed by John Kaltenstein – 2009 (Friends of the Earth)
- Hudson River Foodway Corridor – 2010 (Proof of Concept research grant proposal)
- Marine Highway System: Fact or Fiction?- 2011 (Frank Peake, ASG)
- National Maritime Day Remarks of Ken Wykle – 2007 (National Defense Transportation Association)
- Statement of John Clancey – 2009 (APM Maersk)
- The ILA and Short Sea Shipping: Presentation of Richard Hughes – 2004 (International Longshoremen's Association)
- Trucking's Role in the New Intermodal System – 2011 (Sonney Jones, Dal-Tile/Mohawk)

* ***Full bibliographic information is provided in the Marine Highway Library in Appendix C of this report***
** ***Primary Sources are identified in the "key" column of the Marine Highway Library spreadsheet with a red star*** ★
*** ***Other Useful Sources are identified in the "key": column with a red o***

APPENDIX C: MARINE HIGHWAY LIBRARY

To facilitate use of The Library, the documents are organized in the first three of those categories ("Reports," "PPTs" and "Programs") by subject matter. Documents in the "Journals" category appear chronologically. The Library is intentionally broad in scope but selective to some extent. While the articles contained behind the "Journals" tab include reports on regions of the country in addition to the Atlantic corridor, the documents in the other categories are for the most part national or Atlantic Coast in orientation. A small number of studies and reports in The Library have a Pacific Coast focus, for example, and are included because of their value to the larger discussion.

Within the four categories are reports by and for public commissions and agencies; studies pertaining to specific regions; academic papers; state and MPO transportation planning documents; market analysis for corridors; data pertaining to port infrastructure and freight flow; testimony before Congress; comments in the rulemaking process; proposed marine highway projects; industry forecasts; trade press articles; and presentations prepared for conferences, webcasts and meetings.

The documents and information collected are for the most part freely available on the internet through links provided on The Library spreadsheet. A major exception to that are those available only through subscription. Certain of the documents, by all appearances, are unavailable via the internet and therefore, with very few exceptions, they being made available to the ECMHIAA in digital form.

To enhance the usability of The Library, the documents are cross-referenced according to their information characteristics. With the exception of the "Journals" category, all documents are coded to indicate the nation of origin and coastal orientation; whether the document includes information that would illuminate on matters of market, public benefits, operations, and government policy, including recommendations; and whether the document offers an overview on the subject of marine highways or is primarily on the topic of marine highways.

In the "Reports" category, the framework offers greater detail as to whether: the document identifies types of marine highway service and factors of value to starting new services; discusses facility and operational considerations, existing marine highway services, economic development considerations, and the finance and economics of marine highway projects; compares the surface modes or discusses the intermodal relationship; and offers information on environmental issues and impacts. A "yes" or "no" in the columns provides a quick, if subjective, assessment but can help shorten one's scanning of the documents for material of interest.

The Library then was searched for documents that are representative of the many government and academic studies, as well as items on the role of government policy or which are in other ways of value to this project. Those and other documents directly pertinent to the East Coast Marine Highway Initiative, such as transportation agency studies and plans, and American Marine Highway corridor and project proposals, were identified and selected. Together they represent principal sources—some of them "primary source documents"—used to assemble information, findings and impressions for this task. The selected literature is identified in The Library through red star and "O" symbols.

APPENDIX C: MARINE HIGHWAY LIBRARY - REPORTS

Subject	Key	Title	Author	Sponsor	Type	Year	Nation	Coast	Market	Benef	ServType	Start Pts	Oper	Exist	Modal	Econ Devl	EconFinc	Policy	Envir	Over V	SSS/MH	Recmd	View	Page	Comment	Library	Link
Academic Paper	o	SSS: Barriers, Incentives and Feasibility of Truck Ferry	Joseph Darcy	MIT	Research	2009	US	N	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	N	P		a competent academic thesis paper providing a good overview of issues including vessel availability and defense role; not easily available via internet link	HD	http://dspace.mit.edu/handle/1721.1/49879?show=full
Academic Paper		The Feasibility of Transporting East Coast General Cargo by Ships	Kevin Krick	University of Delaware	Research	2000	US	E	Y	Y	N	N	Y	N	Y	N	Y	Y	N	Y	Y	Y	P		Krick worked at MARAD under Bill Shubert	HD	
Academic Paper		An Economic Feasibility Study of SSS Including the Estimation of Externalities with Fuzzy Logic	Anthanasios Denisis	UMI	Research	2009	US	N	N	Y	Y	N	N	N	Y	N	Y	N	Y	Y	Y	N	-		Doctoral dissertation		http://americasmarinehighways.com/userfiles/adenisis_1.pdf
Academic Paper		The Environmental & Economic Benfeits of SSS by COB	NG	UMI	Paper	2009	US	N	N	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	N	P		paper's focus on container on barger	S	http://towmasters.files.wordpress.com/2011/03/the_environmental__economic_benefits_of_sss_by_cob_2009.pdf
Advocacy and Policy	o	America's Deep Blue Highway	Perry/Borgerson/Weitz	Institute for Global Maritime Studies	Report	2008	US	E	N	Y	Y	N	N	Y	Y	Y	N	Y	Y	Y	Y	Y	P		public and policy benefits of mrine highway utilization and modal shift	S, HD	http://www.igms.org/docs/americas_deep_blue_highway_IGMS_report_sept_2008.pdf
Advocacy and Policy		Report to the Secretary of Transportation	Marine Transportation System National Advisory Council	MARAD	Report	2009	US	N	N	N	N	N	N	N	N	N	N	Y	N	Y	Y	Y	P	-	update to 2005 report to DOT Secy includes MH policy recommendations; 2009 report was not published	S,HD	
Advocacy and Policy		National Maritime Day Remarks	Ken Wykle	National Defense Transportation Assn	Speech	2007	US	N	N	Y	N	N	N	N	N	N	N	Y	N	Y	Y	Y	P		Frmr FHWA administrators address to maritime industry in Washington calls for "revolution" in coastal shipping	HD	
Atlantic Canada		Short sea shipping market study	MariNova	Transport Canada	Study	2005	CA	E/GL	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	-		summary; conclusion that Halifax-Hamilton service not commercially feasible; US-CA Atlantic service possible		http://www.tc.gc.ca/eng/innovation/tdc-summary-14400-14472e-1410.htm
Atlantic Canada		Short sea shipping market study	MariNova	Transport Canada	Study	2005	CA	E/GL	Y	N	Y	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	-		study of potential for SSS betweeen Halifax and Hamilton (and including some US markets) from marketing, technical, economic and policy perspective; concludes SSS service not economic at present		http://www.dieselduck.ca/library/08%20policies/2005%20GOC%20Shortsea%20shipping%20study%2014472e.pdf
Atlantic US/CA		Potential Hub-and-Spoke Container Transhipment Operations in Eastern Canada for Marine Movements of Freight	CPCS Transcom Limited	Transport Canada	Study	2008	CA	E	Y	Y	Y	Y	Y	Y	N	N	N	Y	N	Y	Y	Y	P		executive summary		http://www.tc.gc.ca/eng/policy/report-acf-tp14876-menu-1012.htm
Atlantic US/CA	★	Potential Hub-and-Spoke Container Transhipment Operations in Eastern Canada for Marine Movements of Freight	CPCS Transcom Limited	Transport Canada	Study	2008	NA	E	Y	N	Y	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	P		shows potential for hub/spoke feeder service and new regional SSS services in Eastern Canada; policy "catalyst action options" start page 101		www.bv.transports.gouv.qc.ca/mono/1006998.pdf

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Benefits & Policy Analysis		Increasing Intermodal Transportation in Europe Through Relieazing the Value of Short Sea Shipping	Goksel Tenekecioglu	MIT	Research	2005	EU	EU	N	Y	N	N	Y	N	Y	N	N	Y	Y	Y	Y	Y	P		marine transportation benefits,etc argue for increasing SSS use in EU	HD	http://dspace.mit.edu/bitstream/handle/1721.1/33588/63761852.pdf?sequence=1
Benefits & Policy Analysis	o	Restructuring the Maritime Transportation Industry: Global Overview of Sustainable Development Practices	Comtois/ Slack	Transport Quebec	Study	2007	CA	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	N			useful look at policy and practices in US and globally with a focus on environment and sustainability; short sea figures greatly in the report as both a direction to take but one with some disadvantages as seen in marine transportation	S, HD	http://www.mtq.gouv.qc.ca/portal/page/portal/Librairie/Publications/en/ministere/etudes/rtq0701.pdf
Corridor Analysis	★	Four Corridor Case Studies of SSS Services	Global Insight/ Reeve	USDOT	Analysis	2006	US	N	Y	N	Y	Y	N	N	Y	N	N	Y	N	N	Y	Y	N		the first corridor study of substance	S,HD	http://www.marad.dot.gov/documents/USDOT_-_Four_Corridors_Case_Study_(15-Aug-06).pdf
Corridor Analysis		Feasibility Assessment of SSS to Service the Pacific Coast	Transystems/Manalytics/ CDI/Tedesco/ Westar	CCDoTT	Study	2007	US	W	Y	Y	Y	N	Y	N	Y	N	N	N	N	N	Y	N	N		shelf cover is 2006 release	S,HD	http://www.ccdott.org/transfer/projresults/2005/task%203.21/task%203.21_8a.pdf
Corridor Analysis	★	Short Sea and Coastal Shipping Options Study	Cambridge Systematics	I-95 Corridor Coalition	Study	2005	US	E	Y	N	Y	Y	N	Y	N	N	N	N	N	N	Y	Y	P		defines SSS to include bulk cargo; a useful study less for market information (determined that heavy commodities are a market) but more as a discussion of how the States and transportation agencies figure into SSS and have more to do to better learn the potential for east coast transportation system	HD	http://www.i95coalition.org/i95/Portals/0/Public_Files/pm/reports/full343.pdf
Corridor Analysis		Great Lakes St. Lawrence Seaway Study	US/CA Agencies	USDOT/Transport CA	Report	2007	US/CA	GL	Y	N			N					N		Y	N	N	N		wide ranging report on that region	S	http://www.glsls-study.com/English%20Site/home.html
Corridor Analysis		Great Lakes St. Lawrence Seaway Study	US/CA Agencies	USDOT/Transport CA	Report	2007	US/CA	GL	Y	N	Y	N	Y	N	N	N	N	Y	Y	Y	N	N		99	wide ranging report on that region	HD	
Decision Tool	★	Marine Highway System	GMU SCRAM Team	RITA	Study	2010	US	N	N	Y	N	Y	Y	Y	Y	N	N	Y	N	N	Y	Y			Surface Congestion Reduction Analysis and Modeling Team report on modeling and analyzing route alternatives using James River as case study	HD	http://eastfire.gmu.edu/gmu-consortium/marine-highway/document/GMU%20final%20report%20(under%20tab%207).pdf
Decision Tool	o	Emissions Analysis of Freight Transport Comparing Land-Side and Water-Side Short Sea Routes: Development and Demonstration of a Freight Routing anhd Emissions Analysis Tool	Corbett/Winebrake	USDOT	Report	2005	US	E	N	Y	Y	N	N	N	Y	N	N	N	Y	N	Y	N	-		pre-GIFT mode/route analysis tool		http://climate.dot.gov/documents/emissions_analysis_of_freight.pdf
Decision Tool		SSS in the US: Identifying the Prospects and Opportunities	Henesey/ Yonge	MTLA	Paper	2006	US	N	Y	N	N	Y	Y	N	N	N	N	N	N	Y	Y	N	P		overview of report done for Port Canaveral on assessing the potential of short sea projects	HD	http://www.maritimeadvisors.com/pdf/SSSTRB2006WhitePaper.pdf

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Decision Tool		Short Sea Shipping In Canada: Lessons Learned And Research Model For The Development Of New Services	Roy/ Harrison	CPCS (consultant)	Paper		CA	N	N	N	Y	Y	N	N	N	N	N	N	N	N	Y	N	-		summary of findings in the team's studies on short sea potential in Canada and steps toward project development	HD	http://www.cpcstrans.com/_files/Paper2SSSResearchModel.pdf
EIS Study	o	Cross Harbor Freight Program		PANYNJ	Study	2011	US	E	N	Y	?	?	?	?	?	?	?	?	?	?	?	?			EIS study underway on NY Harbor freight movement options including ferry, truck and rail tunnel options		http://www.panynj.gov/about/cross-harbor.html
Environment Impacts		Floating Smokestacks: Call for Action to Clean Up Marine Shipping Pollution	Scott/ Sinnamon	Environmental Defense	Paper	2008	US	N	N	N	N	N	N	N	N	N	N	Y	Y	N	N	Y			recommendations for cleaner fuels and equipment, ECA regulation, etc	HD	http://www.edf.org/documents/8619_FloatingSmokestacks_report.pdf
Environmental Analysis		The Good Haul	Denning/ Kustin	EDF	Paper	2010	US	E	N	Y	Y	N	N	Y	N	N	N	Y	Y	N	N	N	P	22	showing cleaner operations various modes	S, HD	http://www.edf.org/documents/10881_EDF_report_TheGoodHaul.pdf
Environmental Analysis		Short Sea Shipping: Alleviating the Environmental Impact of Economic Growth	Mulligan/ Lombardo	West Carolina University	Paper		US	N	N	Y	N	N	N	N	N	N	N	N	Y	N	Y	N	N			HD	http://paws.wcu.edu/mulligan/www/SSSenviron.htm
Environmental Analysis		Smog Alert: How Commercial Shipping is Polluting Our Air	Patton/ Scott/ Spencer	Environmental Defense	Report	2004	US	N	N	N	N	N	N	Y	N	N	N	Y	Y	N	N	Y	N		broadly on marine transportation; the 2004 report raises issues that to some extent are less an issue and does not have benefit of improvements in ports, tighter regulation now in place, and vessel changes	HD	http://apps.edf.org/documents/3807_smogalert_2004060.pdf
Environmental Analysis		Transportation's Role in Reducing US GHG Emissions		USDOT	Report	2011	US	N	N	Y	N	N	N	N	Y	N	N	N	Y	N	N	N	-		the short discussion on marine transportation in USDOT report on transportation and greenhouse gas production; shows marine mode comparing favorably	HD	http://americasmarinehighways.com/userfiles/Pages%20from%20DOT_Climate_Change_Report_-_April_2010_-_Volume_1_and_2.pdf
Environmental Impacts	★	Expanding Short Sea Shipping in California	John Kaltenstein	Friends of the Earth/San Francisco Foundation	Report	2010	US	W	N	N	N	N	Y	N	N	N	N	Y	Y	N	Y	Y			focuses on envir issues and recommends clean technologies and operations	S,HD	http://salsa.democracyinaction.org/o/455/images/Short%20Sea%20Shipping.pdf
European Model	o	Short Sea Shipping: US Team Vist to Germany	KT Thirumalai	George Mason University	Research	2010	EU	EU	N	N	Y	N	Y	Y	N	N	N	Y	N	N	Y	N			trip report by team working on SSS/Technology issues under RITA contract	S,HD	http://eastfire.gmu.edu/Marine_Highway_Freight_System/document/German_Visit_Report_Final.pdf
European Model	o	NYS Canal System: Modern Freight-Way	Jeff Belt (Goodban Belt)	NYSDOT/NYSERDA	Study	2010	US	E	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	P		proposes motor barges and demo project, boxed MSW to Upstate landfills (no sure how that squares with NYC plans to export waste out of state);	S, HD	http://www.canals.ny.gov/corporation/modern-freightway.pdf
Feasibility Study		Port Inland Distribution Network, Phase II Action/Business Plan Executive Summary	DMJM Harris| AECOM	Delaware Valley Regional Planning Commission	Feasibility Study	2005	US	E	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	Y	Y	Y	P		COB shuttle from PONYNJ to DelRiver ports	S,HD	http://www.state.nj.us/transportation/airwater/maritime/documents/PhsIIAction_BusinessPlan.pdf
Feasibility Study	★	High Speed Ferries and Coastwise Vessels	Asaf Ashar	CCDoTT	Study	2003	US	E	Y	N	Y	Y	Y	N	N	N	N	N	N	N	Y	Y	N			S,HD	http://www.asafashar.com/ShortSeaNY_Boston_Final.pdf

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Intermodal Facility Access	o	Multi-Client Port Access Project	Cambridge Systematics/ PB	I-95 Corridor Coalition	Report	2003	US	E	N	N	Y	N	Y	Y	N	N	N	Y	N	Y	Y	Y	N			HD	http://i95coalition.org/i95/Portals/0/Public_Files/pm/reports/full186.pdf
Marine Highway Potential	★	SSS Port Probability Study	Mark Yonge/MTLA	Canaveral/MARAD	Study	2005	US	E	Y	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	Y	Y	P		Canaveral commissioned study; this public version is lacking much of the market and other information of specific interest to Canaveral re East Coast service; study is a fairly comprehensive look at SSS in US and EU, survey of stakeholders, factors ports should consider	HD	http://www.2060ftp.org/images/uploads/learn_more/Advisory%20Groups/CPA%20Short%20Sea%20Shipping%20Probability%20Study%20Final%20for%20publication%20Adobe%206.pdf
Marine Highway Potential		High Speed Ferries and Coastwise Vessels	Asaf Ashar	CCDoTT	Study	2000	US	N	Y	N	Y	N	Y	Y	Y	N	N	N	N	N	Y	Y	N			S,HD	http://www.ccdott.org/transfer/projresults/1998/task%203.10/task3.10_3.11.pdf
Marine Highway Potential		Future Strategies for the Development of SSS as a Viable Solution to the Nation's Highway Congestion Problems	MARAD	MARAD	Report	2003	US	N	N	N	N		N					Y		Y	Y	Y	P			S	
Marine Highway Potential		US SSS: Prospects and Opportunities	Gary Lombardo	Short Sea Cooperative	Study	2004	US	N	N	N			Y					Y		Y	Y	N	N		study of economics, etc for SCOOP	S	
Marine Highway Potential		A Shipbuilder's Assessment of America's Marine Highways		NAASCO	Report	2009	US	N	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y	P		shipyard's good assessment of the marine highway potential and issues	HD	http://www.intermodalmarine.com/pdfs/NASSCO%20AMH%20Study%202MB.pdf
Marine Highway Potential		A Survey of SSS and Its Prospects in the US	Perakis/ Denisis	Maritime Policy Mgmt	Paper	2008	US	N	Y	Y	N	N	Y	Y	Y	N	N	N	N	Y	Y	Y	N		a review of the marine highway issues and sources	HD	http://www.maritimeadvisors.com/pdf/Survey%20of%20SSS%20Prospects%20in%20the%20U.S..pdf
MH Viability Issues	★	North American Marine Highways	TTI/ CTR (Kruse/ Hutson)	TRB/UUSDOT	Study	2010	US	N	Y	N	Y	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	-		Examination of qualities associated with success and failures	S,HD	http://onlinepubs.trb.org/onlinepubs/ncfrp/ncfrp_rpt_005.pdf
Modal Comparison		Surface Freight Transportation: A Comparison of the Costs of Road, Rail, and Waterways Freight Shipments That Are Not Passed on to Consumers	Herr/White (?)	GAO	Report	2011	US	N	N	N	N	N	N	N	Y	N	N	Y	N	N	N	N	N		not on SSS per se	S, HD	http://www.gao.gov/new.items/d11134.pdf
Modal Comparison		Evaluation of Environmental and Social Impacts and Benefits of Shortsea Shipping in Canada		Transport Canada	Study	2010	CA	N	N	Y	Y	N	N	N	Y	N	N	Y	Y	Y	Y	Y	P		executive summary; study of social and environmental impacts of the freight modes on certain O/D scenarios; limitations identified include that model tends to favor shortsea as overall impacts of all components in chain are not considered	HD	http://www.tc.gc.ca/eng/policy/acf-acfs-evaluation-of-impacts-and-benefits-2600.htm

APPENDIX C: MARINE HIGHWAY LIBRARY - REPORTS

Subject	Key	Title	Author	Sponsor	Type	Year	Nation	Coast	Market	Benef	ServType	Start Pts	Oper	Exist	Modal	Econ Devl	EconFinc	Policy	Envir	Over V	SSS/ MH	Recmd	View	Page	Comment	Library	Link
Modal Comparison	★	Evaluation of Environmental and Social Impacts and Benefits of Shortsea Shipping in Canada	Genivar	Transport Canada	Study	2008	CA	N	N	Y	Y	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y			"the study demonstrated the potential that shorsea shipping has in terms of helping the government reach its sustainable development objectives"; the costs are generally lower than other modes	HD	
Modal Comparison		A Modal Comparison of Domestic Freight Tranpsortation Effects on the General Public	TTI/ Jim Kruse	MARAD	Report	2009	US	I	N	Y	Y	N	N	N	Y	N	N	N	Y	N	N	N	P			S	
Modal Comparison		Impact of High Oil Prices on Freight Transportation: Modal Shift Potential in 5 Corridors	TEMS	MARAD	Study	2008	US	N	Y	N	Y	N	Y	N	Y	N	Y	N	N	N	Y	Y	P		fuel price as a factor in freight planning (by corridor)	S,HD	http://www.marad.dot.gov/documents/Modal_Shift_Study_-_Technical_Report.pdf
Modal Comparison	o	Environmental Implications of Trucks, Trains, Ships, and Planes	Corbett/ Winebrake	Air & Waste Mgmt	Article	2007	US	N	N	Y	N	N	N	N	Y	N	N	Y	Y	N	N	Y				HD	http://coast.cms.udel.edu/Papers/EMCorbettWinebrake2007.pdf
Modal Comparison		Short Sea Shipping: Lessons For or From Australia	Bendall/ Brooks	Int'l Journal of Shipping and Transport Logistics	Article	2011	AU		N	N	N	N	N	Y	Y	N	N	Y	Y	N	Y	Y			authors consider certain issues and compare findings from US and EU studies with those in Australia; conclude on need for focused study on shipper choices	HD	http://www.maritrade.com.au/publications/IAME2010-Australian-Coastal-Shipping.pdf
Modal Comparison	★	Preferences for alternative short sea shipping opportunities.	Brooks/ Puckett/ Hensher/ Trifts	Institute of Transport and Logistics Studies	Article	2011	CA/US	E	N	N	Y	N	N	N	Y	N	N	N	N	N	Y	N			"working paper" that is final; looks at 3 waterand truck scenarios: Halifax to Boston, Philly and Wilmington NC and explores what are considerations for shippers in making modal choices	HD	
Modal Comparison		Understanding mode choice decisions: A study of Australian freight shippers.	Brooks/ Puckett/ Hensher/ Sammons	Institute of Transport and Logistics Studies	Article	2011	AU		N	N	N	Y	N	N	Y	N	N	Y	N	N	Y	Y			"working paper" that is final; examines in Australian market what goes into shippers' modal choices and gives perspective on how policy might apply in encouraging MH	HD	http://sydney.edu.au/business/__data/assets/pdf_file/0018/111780/ITLS-WP-11-20.pdf
Operational Analysis		Operational Development of Marine Highways to Serve the U.S. Pacific Coast	Bagnell/ Saunders/ Silva/ Tedesco	TRB	Paper	2009	US	W	Y	N	Y	N	Y	N	N	N	Y	N	N	N	Y	N	P		detailed "summary"	HD	http://americasmarinehighways.com/userfiles/operational%20development%20of%20marine%20highways%20to%20serve%20the%20US%20pacific%20coast.pdf
Operational Analysis	★	Operational Development of Marine Highways to Serve the U.S. Pacific Coast	TranSys/ CDI/ Tedesco/ Westar	CCDoTT for ONR	Report	2008	US	W	Y	N	Y	N	Y	N	N	N	Y	N	N	N	Y	N	P		final report	HD	
Operational Analysis	★	Transport Short Sea Shipping Vision	Ron Silva	Westar	Paper	2006	US	W	N	N			Y					N		Y	Y	Y	P			S	http://www.westartransport.com/pdfs/whitepaper_new.pdf

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Operational Analysis	o	Comparison of U.S. and Foreign-Flag Shipping Costs		MARAD	Report	2011																			a somewhat controversial (to the union workforce, primarily) report explaining the cost differential between US and foreign flag shipping in international commerce	HD	http://www.marad.dot.gov/documents/Comparison_of_US_and_Foreign_Flag_Operating_Costs.pdf
Operational Analysis	★	American Marine Highway Design Project	Herbert Engineering Corp.	MARAD	Report	2011																			Final Report that developed and evaluated 11 vessel designs on the basis of market analysis; it is issued as part of the MARAD/Navy dual use initiative	HD	http://www.marad.dot.gov/documents/AMH_Report_Final_Report_102811_updated.pdf
Policy Analysis		White Paper - European Transport Policy for 2010: Time to Decide		European Community	Paper	2001	EU		N	N	N	N	N	N	Y	N	Y	Y	Y	N	N	Y		40	paper lays the groundwork for a common EU multimodal transportation policy	HD	http://ec.europa.eu/transport/strategies/doc/2001_white_paper/lb_texte_complet_en.pdf
Policy Analysis	o	Short-Sea Vessel Service And Harbor Maintenance Tax	Anatoly Hochstein	MARAD/ Nat'l Ports & Waterways Institute	Study	2005	US	N	Y	N	N	N	N	N	N	N	Y	Y	N	N	Y	Y	-		omparison between the amount of HMT collected with private and external benefits	S	
Policy Analysis		Trade and Transportation	National Chamber Foundation	US Chamber of Commerce	Report	2003	US	N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	22		S	
Policy Analysis	★	Short Sea Developments In Europe: Lessons For Canada	Brooks/ Frost	North American Transportation Competitiveness Research Council	Paper	2009	CA	N	Y	N	N	N	Y	N	N	N	N	Y	N	Y	Y	Y	-		examines EU policy and SSS operations with recommendations for CA policy	HD	http://nacts.asu.edu/sites/default/files/NATCRC-NACTS%20Paper%2010%20July%202009.pdf
Policy Analysis		Can Marine Highways Deliver?	John Fritelli	Congressional Research Serv``ice	Paper	2011	US	N	N	N	N	N	N	Y	N	N	N	Y	N	Y	Y	N	N		a review of the marine highway issue but assessment is most on marine highway projects past and present, not the future vision of marhwy as part of transportation system	S, HD	http://www.fas.org/sgp/crs/misc/R41590.pdf
Policy Analysis		An Evaluation of Maritime Policy in Meeting the Commercial and Security Needs of the US	IHS Global	MARAD	Study	2009	US	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	Y	-		this study for MARAD is reportedly skewed by MARAD (and critiqued in other document in this table) but still has useful information	S,HD	http://www.ihsglobalinsight.com/gcpath/MARADPolicyStudy.pdf
Policy Analysis		National Strategy for the Marine Transportation System : An Action Plan	CMTS	DOT/USACE/NOAA/USCG	Plan	2008	US	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	-	41	SSS is mentioned as a means to increasing national transportation capacity	S,HD	http://www.cmts.gov/downloads/National_Strategy_MTS_2008.pdf
Policy Analysis		Impacts of Public Policy on the Freight Transportation System		TRB	Study	2011	US	N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N			discussion on freight policy but only of indirect value to marine traansportation e.g., port drayage trucking; no apparent references to marine highway		http://www.trb.org/Main/Blurbs/Impacts_of_Public_Policy_on_the_Freight_Transporta_164478.aspx?utm_medium=etmail&utm_source=Transportation%20Research%20Board&utm_campaign=TRB+E-Newsletter+-+12-14-2010&utm_content=Web&utm_term

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Policy Analysis		The Competitiveness of European Short-sea Freight Shipping	TML/Nautical Enterprise	European Commission	Study	2010	EU		Y	Y	Y	N	Y	Y	Y	N	N	Y	Y	N	Y	N	-		gain an insight in relative importance of cost factors for the 3 modes; analyze effect of 5 policy scenarios; analyze effect of lowering sulphur emission standard on EU imports/exports		http://www.nauticalenterprise.ie/wp-content/uploads/2010/10/COMPASS_finalreport.pdf
Regional Analysis	★	SSS on the East Coast of North America	Brooks/ Hodgson	Dalhousie for Transport Canada, PoHalifax	Report	2006	NA	E	Y	N	Y	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	P		US/CA market and issues assessment	S, HD	http://myweb.dal.ca/mrbrooks/ShortSeaShipping.pdf
Regional Analysis	★	Bi-State Domestic Freight Ferries Study	Woods/ASW/Robins	NYU/RU for PANYNJ	Study	2006	US	E	Y	N	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	-		market study for cross harbor service	HD	http://wagner.nyu.edu/rudincenter/files/domesticFreightFerries.pdf
Regional Analysis		Drivers of Change: Envisioning North America's Freight Transportation System in 2030	Blank/ Cairns	North American Transportation Competitiveness Research Council	Paper	2008	NA	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	Y		15	sets the stage for other papers on NA transport and Canada gateway role	HD	http://nacts.asu.edu/sites/default/files/Drivers%20of%20change%20-%20Envisioning.pdf
Regional Analysis		Virginia Statewide Multimodal Freight Study, Phase II	Cambridge/ Global Insight/PB/ Moffatt	VDOT	Study	2011	US	E	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N		state freight study of potential use for freight data and plans		http://www.vtrans.org/resources/VSMMFS-II.Final.pdf
Regional Analysis		Maritime Support Services Location Study	SUNY Maritime College	NYCEDC/BNYDC	Study	2007	US	E	N	N	N	Y	Y	N	N	Y	N	N	N	N	N	Y			NYC study of maritime support services industry (drydocks, berth areas, tugs) including inventory of facilities		http://www.nycedc.com/NewsPublications/Studies/MaritimeStudy/Documents/MaritimeSupportServicesLocationStudy_Final.pdf
Report to Congress	★	America's Marine Highway	MARAD	MARAD	Report	2011	US	N	N	Y	N	N	N	Y	N	N	N	Y	Y	Y	Y	N	P		mandated report to Congress	HD	http://www.marad.dot.gov/documents/MARAD_AMH_Report_to_Congress.pdf
Report to Congress		Short Sea Shipping Option Shows Importance of Systematic Approach to Public Investment Decisions	JayEtta Hecker	GAO	Report	2005	US	N	N	N	Y	N	N	Y	N	N	N	Y	N	Y	Y	Y	-		reviews in summary fashion operations and issues; "it is unclear why DOT has already identified SSS as a high priority component of the national freight transportation strataegy and chosen to promote and accelerate its development…such endorsement appears premature	S,HD	http://www.gao.gov/new.items/d05768.pdf
Short Sea Shipping in Canada		Making Connections	Transport Canada	Transport Canada	Report	2006	CA	N	N	N			N					Y		Y	Y	N	P			S	
Transportation Plan	o	Long Island Sound Waterborne Transportation Plan	Cambridge Systematics	NYMTC et al	Plan	2004	US	E	N		N	N	N	N	N	N	N	N	N	N	N	Y	Y		NYMTC Long Island Sound Plan executive summary	HD	http://www.nymtc.org/project/LISWTP_final/documents/Executive%20Summary.pdf
Transportation Plan	★	Long Island Sound Waterborne Transportation Plan	Cambridge Systematics	NYMTC et al	Plan	2004	US	E	N		Y	N	N	N	N	N	N	N	N	N	Y	Y			NYMTC Long Island Sound Plan recommendations	HD	http://www.nymtc.org/project/LISWTP_final/documents/Recommendations.pdf

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Transportation Plan	o	Long Island Sound Waterborne Transportation Plan	Cambridge Systematics	NYMTC et al	Plan	2003	US	E	Y	N	N	N	N	Y	N	N	N	N	N	N	Y	N			NYMTC Long Island Sound Plan Task 2; market and other baseline information for ferry service on LI sound; ferries include pax/truck and pure freight	HD	http://www.nymtc.org/waterborne_plan/files/liswtp_task2.pdf
Transportation Plan	o	Long Island Sound Waterborne Transportation Plan	Cambridge Systematics	NYMTC et al	Plan	2004	US	E	N	N	Y	N	Y	N	N	N	N	N	N	N	Y	N			NYMTC Long Island Sound Plan Task 3 Screening of sites and services for various ferry service types on LI sound; ferries include pax/truck and pure freight		http://www.nymtc.org/waterborne_plan/files/liswtpTask3.pdf
Transportation Plan	o	Long Island Sound Waterborne Transportation Plan	Cambridge Systematics	NYMTC et al	Plan	2004	US	E	N		N	N	Y	N	N	N	N	N	N	N	Y	N			NYMTC Long Island Sound Plan Task 4; evaluation of sites		http://www.nymtc.org/project/LISWTP_final/documents/Evaluation%20of%20Sites.pdf
Transportation Plan	o	Long Island Sound Waterborne Transportation Plan	Cambridge Systematics	NYMTC et al	Plan	2004	US	E	N		Y	N	N	Y	N	N	N	Y	N	Y	Y	N			NYMTC Long Island Sound Plan Task 5: evaluation of services; takes wait-and-see approach on freight		http://www.nymtc.org/project/LISWTP_final/documents/Evaluation%20of%20Services.pdf
Transportation Plan	o	Plan 2035: The Regional Transportation Plan for Northern New Jersey		NJ Transprtation Planning Authority	Plan	2009	US	E	N	N	N	N	N	N	N	N	N	N	N	N	N	N			Includes: "Support the MARAD Marine Highway Program. Explore potential for additional facilities for waterborne freight movement. Support Port Authority improvements to the NY&NJ Railroad carfloat operation between New York City and the Greenville Yard in Jersey City. Consider possibilities for inland port development. Support opportunities for marine transportation for cross-harbor/coastwise short sea shipping and in-region freight barge and ferry services."		http://www.njtpa.org/Plan/LRP2035/default.aspx
Transportation Plan		The Development and Implementation of the PIDN	Bill Ellis	AAPA	Paper	2004	US	E	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	N	Y	N	P		The paper was prepared while the Albany barge still operatored, only to be cancelled a yr or so later; paper is heavy on the whys and hows.	S, HD	
Transportation Plan		Electrifying the Hudson River Food Corridor	New West Technolgies	NYSERDA	Paper	2011	US	E	N	Y	N	Y	Y	N	N	Y	N	N	Y	N	Y	Y			electric reefers for moving NYS farm commodities to market downstream		http://www.ces-ltd.com/uploads/news/id61/Electrifying%20the%20Hudson%20River%20Food%20Corridor%20-%20A%20Conceptual%20Design.pdf
Transportation Plan		Hudson River Foodway Corridor	Joseph Heller	USDA Natural Resources Conservtion Service	Paper	2010	US	E	N	Y	Y	Y	Y	N	N	Y	N	N	Y	N	Y	Y			project description for Hudson River foodway		http://www.lhlircd.net/index.php?option=com_wrapper&view=wrapper&Itemid=62
Transportation Plan		New Jersey Comprehensive Statewide Freight Plan	Parsons Brinckerhoff et al	NJDOT	Plan	2007	US	E	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y	N		of potential use for freight data and plans	HD	http://www.state.nj.us/transportation/freight/plan/pdf/2007statewidefreightplan.pdf

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Transportation Strategies		Innovative Strategies to Raise Efficiencies along Transportation Corridors and at Multimodal Hubs	Leigh Boske	Lyndon John School/CRS	Research	2005	US	N	N	N	N	N	N	Y	N	N	N	Y	N	Y	N	N	-		case studies on how states have addressed gateway and corridor congestion	HD	http://www.utexas.edu/lbj/archive/pubs/pdf/prp_147.pdf

This table is organized by subject

KEY

★: Indicates Key Source; shaded cell indicates source worth attn.
NATION: Country of focus
COAST: National, West, East, Gulf, or Great Lakes
MARKET: Is there information of value to market analysis?
BENEF: Are benefits of MH service discussed?
SERVTYPE: Are types of vessel services discussed?
STARTPTS: Information useful to starting new services
OPER: Are port, vessel or other operational issues discussed?
EXIST: Are existing vessel services discussed?
MODAL: Are modes compared in some way?
ECONDEVL: Is economic development in context of MH discussed?
ECONFINC: Are the economics or project finance details included?
POLICY: Does the document discuss government policy matters?
ENVIR: Are environmental issues discussed?
OVERV: Does the document provide a description of the MH concept?
SSS/MH: Is the document primarily on the subject of short sea or MH?
RECMD: Does the document offer recommendations of any sort?
VIEW: Is there a positive or negative viewpoint?
PAGE: Page where MH section starts or the subject is mentioned.
COMMENT: Additional description, explanation about document.
LIBRARY: Do we have a hard copy (S) or digital copy (HD)?

APPENDIX C: MARINE HIGHWAY LIBRARY - POWERPOINT, TESTIMONY, DATA SOURCES

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AMH Program		PPT. America's Marine Highway Program Update	Lauren Brand	MARAD	Presentation	2011	US	N	N	Y	N	Y	Y	Y	Y	P		update by head of AMH program at USDOT	HD	http://www.fhwa.dot.gov/planning/freight_planning/talking_freight/talkingfreight3_16_11lb.pptx
Commodity, port and vessel data		Publications of Navigation Data Center		IWR/USACE	Data		US	N								-				http://www.ndc.iwr.usace.army.mil/publications.htm
Data		Maritime Trade & Transportation 2007		BTS/RITA	Data	2007	US	N								-				http://www.bts.gov/publications/maritime_trade_and_transportation/2007/index.html
Data		North American Border Crossing/Entry Data		BTS/RITA	Data		US/CN/MX	N								-				http://www.bts.gov/programs/international/transborder/TBDR_BC/TBDR_BC_Index.html
Data		U.S. Waterborne Container Traffic by Port/Waterway in 2009		USACE	Data	2009	US	N								-				http://www.ndc.iwr.usace.army.mil/wcsc/by_portnames09.htm
Data		US Water Transportation Statistical Snapshot		MARAD	Report	2011	US	N	N	N	N	N	N	N	N	-		statistical summaries		http://www.marad.dot.gov/documents/US_Water_Transportation_Statistical_snapshot.pdf
Defense Role	★	TRB Panel: Military Uses of the Marine Highway	Roberta Weisbrod	TRB	Summary	2011	US	N	N	N	Y	Y	Y	Y	Y	P		summary of presentations made at TRB Boston meeting by persons engaged in Navy/MARAD studies relating to dual use approach	HD	
Defense Role	o	PPT. Dual Use Ships for American Marine Highway	John Kaskin	US Navy	Presentation	2011	US	N	N	N	N	N	Y	Y	N				HD	
Defense Role		PPT.CCDoTT Overview AMH Report	Rick Thorpe	CCDoTT	Presentation	2011	US	W	N	N	Y	N	Y	N	N	P		status report on Navy funded project	HD	http://americasmarinehighways.com/userfiles/Present%20CCDOTT%20January%2013%202011%20CWC%202%20PP.pdf
Defense Role	★	PPT. Development of a New Marine Highway Vessel Design Utilizing European Technology & Collaboration	Mark Yonge	Intermodal Marine Lines	Presentation	2011	US	E	N	N	Y	N	Y	N	N	P		presentation at GMU event (look for "Panel 1" on linked site)	HD	http://eastfire.gmu.edu/gmu-consortium/marine-highway/
Defense Role	★	PPT. at CCDoTT Dual Use Ships for AMH	Jonathan Kaskin	US Navy	Presentation	2011	US	N	N	N	N	N	Y	Y	N			presentation of December 13, 2011 at CCDoTT conference	HD	
Development of SSS		Statement of Stephen Flott	Stephen Flott	SeaBridge	Testimony	2007	US	E/G	N	N	N	Y	Y	Y	Y	P		Hse T&I Hearing	S	
Development of SSS		Statement of Sean Connaughton	Sean Connaughton	MARAD	Testimony	2007	US	N	N	N	N	N	Y	Y	N	P		Hse T&I Hearing	S	
Estimating Relationships	o	PPT.Marine Highway System Evaluation Model	Tedesco/Bagnell	CCDoTT	Presentation	2010	US	N	N	N	Y	N	Y	N	N	-		part of Navy funded aMH vessel design process	HD	
European practices		PPT. SPC, Technologies, figures, bottlenecks, best-pratices		SPC Multimodal Transport Solutions	Presentation	2010	EU	N	N	N	Y	Y	Y	Y		P		presentation given GMU team during field trip to Germany	HD	
Feasibility Study		PPT. Port Inland Distribution Network, Phase II Action/Business Plan Executive Summary	DMJM Harris|AECOM	Delaware Valley Regional Planning Commission	Presentation	2006	US	E	Y	Y	Y	N	Y	Y	Y			Business plan outline for COB shuttle from PONYNJ to DelRiver ports	S,HD	http://www.state.nj.us/transportation/airwater/maritime/documents/SJPIDNFinalPresentation_withNotes.pdf
Flow Survey		A Decade of Growth in Domestic Freight Rail and Truck Ton-Miles Continue to Rise		BTS/RITA	Data	2007	US	N								-				http://www.bts.gov/publications/special_reports_and_issue_briefs/special_report/2007_07_27/html/entire.html
Flow Survey		Commodity Flow Survey		BTS/RITA	Data	2007	US	N								-				http://www.bts.gov/publications/commodity_flow_survey/
Flow Survey		Hazardous Materials Highlights – 2007 Commodity Flow Survey		BTS/RITA	Data	2011	US	N								-				http://www.bts.gov/publications/special_reports_and_issue_briefs/special_report/2011_01_26/html/entire.html
Flow Survey		North American Trade Growth Continued in 2007		BTS/RITA	Data	2009	US/CN/MX	N								-				http://www.bts.gov/publications/special_reports_and_issue_briefs/special_report/2009_02_11/html/entire.html

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Flow Survey		U.S. Freight on the Move: Highlights from the 2007 Commodity Flow Survey Preliminary Data		BTS/RITA	Data	2009	US	N								-				http://www.bts.gov/publications/special_reports_and_issue_briefs/special_report/2009_09_30/html/entire.html
Freight Map		Maryland Trucking Map with Port Terminals Indicated		Maryland DOT	Map		US	E										Trucking map		http://www.roads.maryland.gov/OPPEN/Trucker_Back.pdf
Freight Policy	o	Statement of John Clancey	John Clancey	APM Maersk	Testimony	2009	US	N	N	N	N	N	N	N	N	-		highlighted section is general statement at this multimodal freight hearing that maritime should be included in freight policy discussion; "short sea must be made cheap enough to attract commercial customers"	HD	
Freight Policy		Testimony of Neil Pedersen	Neil Pederson	I-95 Corridor Coalition	Testimony	2008	US	E	N	N	N	N	N	N	N	N	8	brief mention of marine highway as part of 2040 vision	S, HD	http://republicans.transportation.house.gov/Media/File/TestimonyHighways/09-18-08-Pedersen.pdf
Harbor Maintenance Tax		Letter for the Hearing Record		Coastwise Coalition	Statement	2008	US	N	N	N	N	Y	Y	Y	Y	P		Statement submitted for the record on proposal to stimulate the economy	HD	
HMT Analysis		Improving Interstate Corridor Capacity Through the Harbor Maintenance Tax	Paul Bea	Coastwise Coalition	Advocacy	2011	US	N	N	Y	N	N	Y	Y	Y				HD	
Homepage		Short Sea Shipping in Europe		EC	Website		EU	N								-				http://ec.europa.eu/transport/maritime/short_sea_shipping/short_sea_shipping_en.htm
Hudson River		PPT. Floating Food: SSS for NYC's Food Supply	Amy Bucciferro	Floating Food	Presentation	2010	US	E		Y	Y	N	Y		Y	P		Hudson River agriculture movement from farm to market		http://www.youtube.com/watch?v=66l8m3X3GY0
Issue Brief for Hearing		Creating Jobs and Increasing Exports by Enhancing the MTS		House Cmte on Transportation & Infrastructure	Memorandum	2011	US	N	N	N	N	Y	Y	Y	N			factual information on Jones Act, AMH, MTS to prepare committee for a hearing on exports and the MTS	HD	http://republicans.transportation.house.gov/Media/file/112th/CGMT/briefingmemo%206-14.pdf
Jones Act and foreign trades		U.S.-flag privately-owned oceangoing merchant fleet		HIS Fairplay	Table	2009	US	N	N	N	N	N	N	N	N	-		tally ships of 10,000 deadweight (DWT) or greater as of 2009 end		http://www.marad.dot.gov/library_landing_page/data_and_statistics/Data_and_Statistics.htm
Labor	o	PPT. The ILA and Short Sea Shipping	Richard Hughes	ILA	Presentation	2004	US	N	N	N	N	N	Y	N	N	P		Presentation at SSS conference	HD	
M-5 Corridor		PPT. SSS The Next Mode of Transportation	Ron Silva	Westar	Presentation	2007	US	W	N	Y	Y	N	Y	N	N	P		promotion	HD	http://www.valleyair.org/Symposiums/2007/ShortSeaShipping.pdf
M-5 Corridor		PPT. SSS The Next Mode of Transportation	Ron Silva	Westar	Presentation	2007	US	W	N	Y	Y	N	Y	N	N	P		promotion	HD	http://www.valleyair.org/Symposiums/2007/ShortSeaShipping.pdf
Maritime Policy	o	National Maritime Day Remarks	Ken Wykle	National Defense Transportation Assn	Speech	2007	US	N	N	Y	N	Y	Y	Y	Y	P		Frmr FHWA administrators address to maritime industry in Washington calls for "revolution" in coastal shipping	HD	
MH Policy Issues	o	PPT. AMH Policy Alternative	Henry Marcus		Presentation	2011	US	N	N	N	N	N	Y	Y	N			presentation at TRB meeting	HD	
MH Policy Issues		PPT. Marine Highway Potential & Policy	Paul Bea		Presentation	2010	US	N	N	Y	N	Y	Y	Y	Y	P		presentation at AAPA conference in Tacoma, WA	HD	
MH Policy Issues		Remarks of Paul Bea	Paul Bea		Remarks	2008	US	N	N	N	N	N	Y	Y	Y	P		Rep. John Mica held a roundtable of about 15 persons to hear about marine highways	HD	
MH Policy Issues		Statement of Stephen Flott	Stephen Flott	SeaBridge	Testimony	2007	US	N	N	N	N	Y	Y	Y	Y	P		Hse T&I Hearing	S	
MH Policy Issues		MTSNAC Meeting Minutes	MTSNAC	MARAD	Minutes	2008	US	N	N	N	N	N	N	Y	Y	P	25	link only to minutes of meeting;	S,HD	http://www.mtsnac.org/public/docs/minutes/FINAL_MTSNAC_Mtg_Minutes-Washington_DC_Sep_17-18_2008.pdf

APPENDIX C: MARINE HIGHWAY LIBRARY - POWERPOINT, TESTIMONY, DATA SOURCES

Subject	Key	Title	Author	Sponsor	Type	Year	Nation	Coast	Market	Benef	Oper	OverV	SSS/MH	Policy	Recmd	View	Page	Comment	Library	Link
MH Policy Issues	o	Marine Highway System: Fact or Fiction?	Frank Peake	American Shipping Group	Presentation	2011	US	N	N	Y	Y	N	Y	Y	Y			presentation giving existing Jones Act operator view of present marine highway status and what is needed for future viable service e.g. no subsidies except for shippers	HD	
MH Proposal		A National Short Sea Shipping Initiative	Stas Margaronis	self	Testimony	2007	US	N	N	N	N	Y	Y	Y	Y	P			S	http://www.santamariashipping.com/short_shipping_initiative_02-07.html
Port and Waterway Facilities		US Waterway Data	USACE	IWR/USACE	Data		US	N								-		waterfront facilities by port, excel or access formats		http://www.ndc.iwr.usace.army.mil//ports/ports.htm
Port Canaveral		2009 Economic Impact of Port Canaveral	Martin Associates	Port Canaveral	Data	2010	US	E	N	Y	Y	N	N	N	N			analysis of port's effect on economy		http://www.portcanaveral.com/general/news/canaveral_impact_report_51010.pdf
Port Canaveral		Port Canaveral Master Plan 2007-2027		Port Canaveral	Data	2007	US	E	N	N	Y	N	N	N	N			masterplan contains much information on facilities, issues and plans		http://www.portcanaveral.com/general/images/masterplan.pdf
Port of Baltimore		Maryland Port Administration promotion materials		MPA	Data	2008	US	E	Y	N	Y	N	N	N	N			MPA 2008 Strategic Plan	S	http://www.mpa.maryland.gov/_media/client/planning/StategicPlanFinal1208OS.pdf
Port of Baltimore		Maryland Port Administration promotion materials		MPA	Data		US	E	N	N	Y	N	N	N	N			MPA facility fact sheets	S	http://pobdirectory.com/news/resources/marine-terminals-public/
Port of Baltimore		Maryland Port Administration promotion materials		MPA	Data	2007	US	E	Y	N	Y	N	N	N	N			Vision 2025	S	http://www.mpa.maryland.gov/_media/client/planning/MPA%202025%20Vision%20Plan.pdf
Port of New Bedford		Critical Path Projects for Port Growth & Sustainability	Kristin Decas	Port of New Bedford	Plan	2009	US	E	N	N	N	N	Y	Y	N	P		projects/plans summary	HD	
Port of New Bedford		New Bedford - An Intermodal Shipping Port		Port of New Bedford	Promotion		US	E	Y	Y	Y	N	N	N	N			promotional material provided information on facilities, access, terminal expantion, etc	HD	http://www.designprinciples.com/portofnb/doclinks/shipping_intermodel.pdf
Port Raritan		Project Plan		STC Marine, LLC	Plan		US	E	Y	Y	Y	N	Y	Y	N			General description of the Port Raritan plans	S	
Project Overview		PPT. Intermodal Marine Lines	Mark Yonge	Intermodal Marine Lines	Presentation	2011	US	E	N	N	Y	N	Y	N	N	P			HD	http://americasmarinehighways.com/userfiles/IML%20Project%20Overview%20presentation%20to%20Coastwise%20Coalition%20Jan%2013%202011(Corrected).pdf
Regional Analysis		Portfields Initiative: Development Opportunities for Warehousing & Distribution Centers		PANYNJ/NJ EDA	Inventory	2006	US	E	N	N	Y	N	N	N	N			Port Authority and State economic development agency inventoried developable brownfields in port		http://www.panynj.gov/real-estate-development/portfields-initiative.html
Sector Information		A Reliable Waterway System is Important to Agriculture		USDA	Data	2011	US	N	Y	Y	Y	N	N	Y	N				S, HD	http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5093803
Shipbuilding		PPT.Status of PDMT Panel Project on SSS	Malone/Tedesco	NSRP	Presentation	2007	US	N	N	N	Y	Y	Y	Y	N	P		looking to developing SSS design	HD	http://www.nsrp.org/Ship_Production_Panels/Ship_Design/downloads/060507_SSS_Status_Malone.pdf
Shipbuilding		PPT. Status of PDMT Panel Project on SSS	Malone/Tedesco	NSRP	Presentation	2007	US	N	N	N	Y	Y	Y	Y	N	P		looking to developing SSS design	HD	http://www.nsrp.org/Ship_Production_Panels/Ship_Design/downloads/060507_SSS_Status_Malone.pdf
Shipper Perspective	o	PPT.Short Sea Logistics: M-10 Marine Highway	Sonney Jones	Dal-Tile/Mohawk Industries	Presentation	2011	US	E/G	Y	Y	Y	N	Y	Y	N	P		presentation of shipper advocate of AMH development	HD	http://aapa.files.cms-plus.com/SeminarPresentations/2011Seminars/11FacilitiesEngineering/Jones_Sonney.pdf
Shipper Perspective	o	PPT.Trucking's Role in the New Intermodal System	Sonney Jones	Dal-Tile/Mohawk Industries	Presentation	2011	US	G	Y	N	Y	N	Y	N	N	P		presentation by shipper at the Journal of Commerce North American Marine Highway Conference	HD	
Summary		Highlights of 2008 National Census of Ferry Operators	Bureau of Transportation Statistics	BTS/RITA	Data	2010	US	N								-				http://www.bts.gov/publications/special_reports_and_issue_briefs/special_report/2010_12_01/html/entire.html

APPENDIX C: MARINE HIGHWAY LIBRARY - POWERPOINT, TESTIMONY, DATA SOURCES

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USACE managed statistics		Waterborne Commerce Statistics Center		IWR/USACE	Data		N	N												http://www.ndc.iwr.usace.army.mil/wcsc/wcsc.htm
Vessel Speed		PPT.Public Workshop: Vessel Speed Reduction for Ocean-Going Vessels		California Air Resources Board	Presentation	2009	US	W	N	N	Y	N	N	Y	N	-		paper is on vessel speeds and emissions		http://www.arb.ca.gov/ports/marinevess/vsr/docs/072909speakingnotes.pdf

This table is organized by subject

KEY

NATION: Country of focus
COAST: National, West, East, Gulf, or Great Lakes
MARKET: Is there information of value to market analysis?
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APPENDIX C: MARINE HIGHWAY LIBRARY - PROGRAM, PROJECT, REGULATION

Subject	Key	Title	Author	Sponsor	Type	Year	Nation	Coast	Market	Benef	Oper	OverV	SSS/MH	Policy	Recmd	View	Page	Comment	Library	Link
AMH Project	o	Hudson River Foodway Corridor			Proposal	2009	US	E	Y	N	Y	N	Y	N	N			proposal for AMH grant for proof of concept for barging agricultural goods to market down the Hudson River	HD	http://www.i95coalition.org/i95/Portals/0/Public_Files/pm/reports/I95CC%20-%20Marine%20Highway%20Proposal%202009_0528.pdf
AMH Corridor	★	Application for Designation of the I-95 Marine Highway Corridor	George Schoener	I-95 Corridor Coalition	Proposal	2009	US	E	N	N	N	Y	Y	N	N	P			S,HD	
AMH Corridor		Submission of Proposed Marine Highway Corridors		New York Metropolitan Transportation Council	Proposal	2009	US	E	N	Y	N	N	Y	N	N			basic elements of suggested corridors within the MPO's jurisdiction	S	http://republicans.transportation.house.gov/Media/file/112th/Highways/Reauthorization_document.pdf
AMH Legislation		Mica Bill Description		Rep. Mica (R-FL)	Legislation	2011	US	N	N	N	N	N		Y	Y	P	15, 17	proposed surface transportation bill contains MH provision on HMT	HD	http://edocket.access.gpo.gov/2010/pdf/2010-8619.pdf
AMH Program		Solicitation of Project Applications		MARAD	RFP	2010	US												HD	http://edocket.access.gpo.gov/2010/pdf/2010-20013.pdf
AMH Program		Solicitation of Grant Applications		MARAD	NOFA	2010	US											designated AMH projects are eligible	HD	http://www.marad.dot.gov/documents/Marine Highway_Corridors_Map.pdf
AMH Program		AMH Corridors		MARAD	Map	2010	US												HD	http://www.marad.dot.gov/documents/Marine_Highway_Corridors13_Sep_10.pdf
AMH Program		AMH Corridors		MARAD	Program	2010	US												HD	http://www.marad.dot.gov/documents/Marine Highway_Project_Description_Designated.pdf
AMH Program		AMH Projects		MARAD	Program	2010	US											Designated AMH Projects	S,HD	http://www.marad.dot.gov/documents/Marine Highway_Initiative_Descriptions_Designated.pdf
AMH Program		AMH Initiatives		MARAD	Program	2010	US											Designated AMH initiatives, including the West Coast projects under study	S,HD	http://americasmarinehighways.com/userfiles/HR6-SST_as_enacted.pdf
AMH Program		Enacted Short Sea Transportation Provisions		Congress	Law	2007	US											maritime provisions of the Energy Independence and Security Act of 2007	HD	
AMH Program Rulemaking		Comments	George Schoener	I-95 Corridor Coalition	Memo	2008	US	E	N	N	N	N	Y	N	Y				S	http://www.state.nj.us/transportation/airwater/maritime/documents/njdotmarinehighwayprojectapplication06-11-10.pdf
AMH Project	★	New Jersey Marine Highway Platform		NJDOT	Proposal	2009	US	E	Y	Y	Y	N	Y	N	N			identifies terminal areas of potential and proposed use for marine highway operations	HD	
AMH Project	★	Atlantic and Gulf Coast Short Sea/Feeder Service	American Feeder Lines	Galveston/SCSPA	Proposal	2009	US	E	Y	Y	Y	N	Y	N	N			full Atlantic and Guf coast service domestic and international cargo	HD	
AMH Project	★	AMH I-95 Corridor Service Project		New Bedford/ MPA/Canaveral	Proposal	2009	US	E	Y	Y	Y	N	Y	N	N			New England to Florida service with Baltimore mid-stop with domestic cargo focus	HD	
AMH Rule		Final Rule		MARAD	Regulation	2010	US												HD	http://americasmarinehighways.com/userfiles/MARAD-2010-0035-0001%5B1%5D.pdf
AMH Rule		Comments	David Hull	Humboldt Bay District	Regulation	2009	US	W	N	N	N	Y	Y	Y	Y	P			HD	
AMH Rule		Comments	John Duffy	Matanuska-Susitna Borough	Regulation	2009	US	W	Y	Y	Y	Y	Y	N	Y	P		Upper Cook Inlet Marine Highway Corridor Nomination	HD	
AMH Rule		Comments	Glenn Vanselow	PNWA	Regulation	2009	US	W	Y	N	N	N	Y	N	N	P		2005 Columbia/Snake River System	HD	
AMH Rule		Comments	Mary K Murhpy	NJTPA	Regulation	2009	US	E	N	N	N	N	Y	Y	Y	-			HD	
AMH Rule		Comments	Stanley Mikus	Cross Sound Ferry	Regulation	2009	US	E	Y	Y	Y	Y	Y	Y	Y	P			HD	
AMH Rule		Comments	Nick Walsh	Philadelphia Regional Port	Regulation	2009	US	E	Y	N	N	N	Y	N	N	P			HD	http://www.pnwa.net/ceder/Appendix%20E%20Abbreviated%20CEDER%20MTS%20Facilities%20Inventory.pdf
AMH Rule		comments	Kristin Decas	New Bedford	Regulation	2009	US	E	Y	N	Y	N	Y	N	N	P		the port's facilities	HD	
AMH Rule		Comments	James Haussener	CMANC	Regulation	2009	US	W	N	N	N	Y	Y	Y	Y	P		Caifornia focus	HD	
AMH Rule	o	Comments	John Kaltenstein	Friends of the Earth	Regulation	2009	US	N	N	Y	N	N	Y	Y	Y	N		Strongly worded caution that all environmental issues should be examined to make sure new marine transportation service is improvement	HD	

APPENDIX C: MARINE HIGHWAY LIBRARY - PROGRAM, PROJECT, REGULATION

Subject	Key	Title	Author	Sponsor	Type	Year	Nation	Coast	Market	Benef	Oper	OverV	SSS/MH	Policy	Recmd	View	Page	Comment	Library	Link
AMH Rulemaking		Comments	Terry Dressler	Santa Barbara APCD	Regulation	2009	US	W	N	N	N	N	Y	Y	Y	-		environ analysis needed	HD	
Defense Role		MOA of MARAD and USN on Duel Use Ships		MARAD/USN	Document	2011	US	N	N	N	N	N	Y	Y	N			Development, Design, Construction, and Operation of Dual-Use Vessels	HD	http://europa.eu/legislation_summaries/environment/tackling_climate_change/l24465_en.htm
Marco Polo		The Marco Polo Programme		European Union	Program	2007	EU												HD	

This table ordered by subject

KEY
VALUE: Approximation of information value to M-5 Study
NATION: Country of focus
COAST: National, West, East, Gulf, or Great Lakes
MARKET: Is there information of value to market analysis?
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APPENDIX C: MARINE HIGHWAY LIBRARY - JOURNALS, PRESS

Subject	Key	Title	Author	Publication	Type	Date	Coast	View	Comment	Art.#	Link
M-580 project		Marine Highway's Rising Stock	J Grey	Lloyd's List	Opinion	12/15/11	N		cynical piece pessimistic about marine highway in the US	102	http://www.lloydslist.com/ll/sector/containers/article386729.ece
AMH Policy		Lloyds Doomed to stay with trucks (JGrey) Dec 2011	Bob Edmonson	Journal of Commerce	Article	12/12/11	W		Stockton M580 project	103	http://www.joc.com/government-regulation/marine-highways-rising-stock
MH Potential		Port of Stockton Selects Savage			Release	12/05/11	W		M580 operator announced	101	http://finance.yahoo.com/news/Port-Stockton-Selects-Savage-bw-2064423456.html
Dual use		Marine Highway's New Direction	Asaf Ashar	Journal of Commerce	Opinion	11/28/11	N		summarizes lo/lo and ro/ro possibilities and concludes on feasibly ro/ro approach	100	http://www.joc.com/commentary/marine-highways-new-direction
Transshipping		Connecting the Dots	Peter Leach	Journal of Commerce	Article	11/28/11	N		review of transhipment port development east of Panama, primarily in Caribbean	99	http://www.joc.com/portsterminals/connecting-dots
AMH Policy		Deep-Six the HMT	Peter Tirschwell	Journal of Commerce	Opinion	10/31/11	N		proposes elimination of HMT as it is not market/port based	98	http://www.joc.com/commentary/deep-six-hmt
Labor		JOC Ports of Seattle Tacoma Reopen After Protest	Peter Leach	Journal of Commerce	Article	10/03/11	W		Canadian gateways drawing US cargo; HMT cited as an advantage	91	http://www.joc.com/maritime/us-box-loss-canadas-gain
Labor		ILWU Defies Court Order	Michael Hansen	Hawaii Reporter	Opinion	09/21/11	N		Shipper rep view on Horizon Lines financial weakness and hindrance of US Build requirement	86	http://www.hawaiireporter.com/horizon-lines-troubles-show-need-for-reform-of-us-build-requirement/123
Transshipping		CMA CGM Invests $100M in Kingston Hub	Robert Wright	Financial Times	Article	09/19/11	E		Subject: American Feeder Lines	89	http://www.ft.com/cms/s/0/8e5be11e-c9c4-11e0-b88b-00144feabdc0.html
Competition		US Box Loss is Canada's Gain		Journal of Commerce	Article	09/12/11	W		Washington State senators letter to FMC requesting investigation of CN diversion and role of HMT	85	
MH Overview		America's Marine highway a/k/a SSS: A Win-Win Proposition	Bill Mongelluzzo	Journal of Commerce	Article	09/09/11	W		ILWU job actions in PNW	84	http://www.joc.com/portsterminals/port-seattle-tacoma-reopen-after-protest
MH Project		Feeder Company Hope For Coastal Revival	Bill Mongeluzzo	Journal of Commerce	Article	09/07/11	W		ILWU strike at Longview	96	http://www.joc.com/labor/ilwu-continue-strike-despite-restraining-order
Industry Data		Telling the Distribution Center Story		Pacific Maritime	Release	09/06/11	W		Agriculture exporter to locate facility at Stockton	83	http://www.pmmonlinenews.com/2011/09/acx-to-cash-in-on-marine-highway-with.html
Mode Analysis		River Barges Still Play A Role in US Transportation	Alex Breitler	Recordnet.com	Article	08/19/11	W		air district funding support for M-580 project	67	http://www.recordnet.com/apps/pbcs.dll/article?AID=/20110819/A_NEWS/108190316/-1/A_NEWS
Jones Act		Horizon Lines Troubles Show Need for Reform of US Build Requirement	Bill Mongeluzzo	Journal of Commerce	Article	08/08/11	W		ILWU strike at Longview	97	http://www.joc.com/portsterminals/port-seattle-tacoma-reopen-after-protest
HMT		Senator Request FMC Cargo Diversion Probe	Peter Leach	Journal of Commerce	Article	08/08/11	E		Carrier investing in Jamaica hub port	92	http://www.shippingposition.com/article/cma-cgm-invests-100-million-kingston-jamaica-port
Labor		Ports of Seattle, Tacoma Reopen After Protest			Release	08/02/11	W		railroad in Port of Stockton bought by OmniTRAX	78	http://www.omnitrax.com/media-center/news/11-08-02/omnitrax-adds-stockton-terminal-eastern-railroad.aspx
M-580 project		ACX to Cash In on MH With New Facility at Stockton Port	Charlie Bermant	Peninsula Daily News	Article	07/29/11	W		potential project Port Townsend to SeaTac	72	http://www.peninsuladailynews.com/article/20110729/news/307299985/port-of-port-townsend-considers-8216-marine-highway-8217-project
Items		Shortsea Shipping Short-circuited?	Bob Edmonson	Journal of Commerce	Article	07/25/11	N		Navy and MARAD dual use plans could help jumpstart MH	76	http://www.joc.com/government-regulation/marine-highways-next-stop-v
Emissions		American Resolve, Innovation and Persistence Wanted	Bob Edmonson	Journal of Commerce	Article	07/13/11	N		Kaskin remarks at TRB meeting	70	http://intermodalmarine.com/pdfs/Navy%20Official%20Calls%20for%20a%
Congestion		Study: Building Roads to Cure Congestion Is an Exercise in Futility	Kelly Johnson	Sacramento Business Journal	Article	07/12/11	W		California export s	73	http://www.bizjournals.com/sacramento/news/2011/07/12/california-exports-improve-19th-month.html
Report Critique		Review of An Evaluation of Maritime Policy in Meeting the Commercial and Security Needs of the United States	Bob Egelko	SFGate.com	Article	07/08/11	W		Rt 101 widening rejected	74	http://articles.sfgate.com/2011-07-08/bay-area/29750198_1_redwoods-richardson-grove-state-park-caltrans
M-580 project		OmniTRAX Adds Stockton Terminal & Eastern Railroad	Clay Cook	Maritime Executive	Article	06/01/11	N		questions government commitment to AMH, points to need for shipbuilding	77	http://www.maritime-executive.com/article/dead-in-the-water
AMH Policy		Dead In the water?	Eric Kulisch	American Shipper	Article	06/01/11	W		update on project	68	
Dual use		Marine Highways' Next Stop: Washington	Craft/Sun	Urban Omnibus	Article	05/25/11	E	P	NY Metro area focus	62	http://urbanomnibus.net/2011/05/from-trucks-to-tugs-short-sea-shipping/
Jones Act		Domestic Shipping Faces Choppy Waters	Damian Brett	IFW	Article	05/23/11	N		ATA/IHSGlobal forecast on intermodal volumes and modes; 2% growth seen for SSS intermodal	60	
Highway problem		Redwoods Win Out Over Road in Judge's Ruling	Katerina Kerr	IFW	Article	05/19/11	N		Sustainable Shipping Initiative - industry forum vision on industry need to address sustainability etc	61	
Exports		California Exports Improve for 19th Month	Tanya Snyder	DC Streetsblog	Article	05/11/11	N		road building doesn't solve congestion	80	http://dc.streetsblog.org/2011/05/31/study-building-roads-to-cure-congestion-is-an-exercise-in-futility/
MH Potential		Port of Port Townsend Considers Marine Highway	Bob Edmonson	Journal of Commerce	Article	05/02/11	N		Jones Act and vessel construction for marine highway	75	http://www.joc.com/maritime/domestic-shipping-faces-choppy-waters

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Subject	Key	Title	Author	Publication	Type	Date	Coast	View	Comment	Art.#	Link
MH Potential		Navigating Obstacles: Trials & Tribulations of Short-Sea Shipping	Bob Edmonson	Journal of Commerce	Article	05/02/11	N		Navy and MARAD looking at dual use designs	69	http://www.joc.com/short-seabarge/multipurpose-ship-short-sea
Dual use		Navy Official Calls for a Fleet of Dual-Use Marine Highway Ships	William Cassidy	Journal of Commerce	Article	05/02/11	N		Intermodal trucking can welcome marine options	17	
Dual use		A Multipurpose Ship for Short-Sea?	Blaine Collins,	Det Norske Veritas	Opinion	05/01/11	N		US should undertake marine highway and LNG use	54	http://americasmarinehighways.com/userfiles/AMH%20E%20Newsletter%208.pdf
M-580 project		High on Marine Highway		ILWU newsletter	Article	04/20/11	W	N	report on lobbying activity and negative statements about Federal funding of port infrastructure for marine highway projects	63	http://www.ilwu.org/?p=2374
M-580 project		Air District Funds Give Marine Highway Project Boost	Blaine Collins	American Marine Highways	Interview	03/27/11	N		MH, ECA and fuel	81	http://americasmarinehighways.com/content/view/Q%20AND%20A%20INTERVIEWS/PERSPECTIVES/Blaine%20Collins%20-%20Director%20of%20External%20Affairs%20Det%20Norske%20Veritas%20Classification%20-Americas-%20Inc
M-580 project		Transit Chief Backs Waterways for Moving Cargo	Bruce Dorminey	The Daily Climate	Article	01/20/11	N		MH as a way to mitigate congestion; including challenges	28	http://wwwp.dailyclimate.org/tdc-newsroom/2011/01/coastal-shipping
Legislative Report		ILA Legislative and Regulatory Update	Bob Edmonson	Journal of Commerce	Article	01/10/11	E		I-95 corridor and study grant	19	
Freight Policy		ILWU Joint Legislative Conference Tackles Key Issues		DNV: Managing Risk	Interview	12/27/10	N		Q&A on ECA limits and how industry will manage: Per Heidenreich, Jhosford, EVanRyncach, Jhatley	48	
marine highway potential		From Trucks to Tugs: Short Sea Shipping	Joseph Keefe	Maritime Professional	Article	12/15/10	N		misc SSS items	82	http://www.maritimeprofessional.com/Blogs/The-Final-Word-with-Joseph-Keefe/December-2010/Shortsea-Shipping-Short-circuited--Don%E2%80%99t-bet-on-it.aspx
MH Potential		A Canadian Vision for a Stronger Maritime Future	Chris Dupin	American Shipper	Article	10/01/10	N		AmH program; MH overview; project designations	27	
Maritime Industry Vision		Shipping Giants Publish Vision for next 30 years	Robert Poole	Surface Transportation Innovations	Essay	09/17/10	N	N	Cites NAMH #5 paper that identifies factors common in unsuccessful MH projects	9	
Intermodal		Trucks to Dominate for Next 10 years	John Kaltenstein	Sustainable Shipping Blog	Opinion	08/13/10	N		SSS needs to be examined for environmental impacts; same guy wrote Friends of the Earth paper in 2011	35	
AMH Potential		AMH Q&A	Keith Barry	Wired	Article	07/23/10	N		AMH program and MH potential; mention of Stockton project	26	http://www.wired.com/autopia/2010/07/dot-turns-underused-waterways-into-marine-highways/
AMH Potential		AMH Q&A	Phillip Longman	Washington Monthly	Article	07/01/10	N	P	a look at the MH potential, benefits, etc ; examples include 64 Express, Humboldt Bay, SeaBridge Freight	25	http://www.washingtonmonthly.com/features/2010/1007.longman.html
AMH Potential		AMH Q&A	Clay Cook	Marine Money	Paper	05/01/10	N		detailed piece on Jones Act vessel financing	21	
AMH Policy		AMH Q&A	Bob Edmonson	Journal of Commerce	Article	04/05/10	N		Safety and environmental benefits of MH	18	
AMH Policy		AMH Q&A	Ray LaHood	USDOT	Interview	03/16/10	N		Secretary LaHood on TIGER trants, financing new vessels, fuel	49	http://americasmarinehighways.com/userfiles/Secretary%20of%20Transportation%20Ray%20LaHood%20Marine%20Highways%20Q_A.pdf
AMH Potential		AMH Q&A		Maritime Professional	Article	02/22/10	N			22	
AMH Policy		AMH Q&A	Tracey Bosman, Robin Hanna	Site Selection	Article	02/17/10	N		real estate industry publication article on benefits of distribution centers	88	http://www.siteselection.com/ssinsider/snapshot/Telling-the-Distribution-Center-Story.htm
AMH Potential		AMH Q&A	Raina Clark	Marine Link	Article	01/01/10	N		potential vs challenge of starting short sea service	71	http://www.marinelink.com/news/navigating-obstacles334702.aspx
AMH Policy		AMH Q&A		ILA newsletter	Article	01/01/10	N	P	report on key federal issues	64	http://www.ila2000.org/leg_update.html
MH Market		AMH Q&A		Coast Longshore Division Newsletter	Opinion	01/01/10	W	N	ILWU thinking on why SSS is bad for the union; basis for their lobbying against HMT	34	http://www.longshoreshippingnews.com/2011/02/the-case-against-short-sea-shipping/
MH Program		AMH Q&A	Jim Oberstar	US Rep	Interview	10/29/09	N		on MH policy related matters	51	http://americasmarinehighways.com/userfiles/Congressman%20James%20Oberstar%203%20AMH%20Questions %282%29.pdf
Emissions		Enquete	Stephen Flott	SeaBridge	Interview	10/26/09	N		Flott on the need for vision and risktaking	52	http://americasmarinehighways.com/userfiles/Stephen%20Flott%203%20AMH%20Questions.pdf
HMT		The US HMT: A Bad Idea Whose Time Has Passed?	John Mica	US Rep	Interview	10/02/09	N			53	http://americasmarinehighways.com/content/view/Q%20AND%20A%20INTERVIEWS/INTERVIEWS%20AND%20DISCUSSIONS/Congressman%20John%20Mica%20%20R-FL%20%20Ranking%20Member%20-%20Committee%20on%20Transportation%20and%20Infrastructure

APPENDIX C: MARINE HIGHWAY LIBRARY - JOURNALS, PRESS

Subject	Key	Title	Author	Publication	Type	Date	Coast	View	Comment	Art.#	Link
MH Plan		Marine Highway Gets $750K Boost	John Reeve	Reeve & Assoc	Interview	09/24/09	N		Reeve is consultant who has done several SSS market studies; interview treats subject in no great detail	50	http://americasmarinehighways.com/userfiles/John%20Reeve%203%20AMH%20Questions.pdf
MH Market		Great Lakes Short Sea Shipping and the Domesetic Cargo-Carrying Fleet	Kevin Mack	Columbia Coastal	Interview	09/22/09	N		Mack talks about need for shipper incentive	55	http://americasmarinehighways.com/userfiles/Kevin%20Mack%203%20AMH%20Questions%281%29.pdf
MH Policy		Falling Short?	Hank Hoffman	SeaBridge Freight	Interview	09/21/09	N		Hoffman talks about MH infrastructure needs	56	http://americasmarinehighways.com/content/view/Q%20AND%20A%20INTERVIEWS/INTERVIEWS%20AND%20DISCUSSIONS/Hank%20Hoffman%20-%20President%20and%20CEO%20-%20SeaBridge%20Freight
Freight Policy		Add Water to the Infrastructure Mix	Doug Sartain	Shipmate Logistics	Interview	09/15/09	N		Maket factors	58	http://americasmarinehighways.com/content/view/Q%20AND%20A%20INTERVIEWS/INTERVIEWS%20AND%20DISCUSSIONS/Doug%20Sartain%20-%20President%20of%20Shipmate%20Logistics
Congestion		Waterways Could be Key to Freeing Up Freeways	Stephen Pepper	Hunboldt Maritime Logistics	Interview	09/15/09	N		Pepper suggests need for those who influence portside costs to recognize their role in making short sea possible	57	http://americasmarinehighways.com/userfiles/Stephen%20Pepper%203%20AMH%20Questions.pdf
MH Potential		The Erie Canal: Lessons for Short Sea Shipping	Torey Presti	National Shipping of America	Interview	09/08/09	N		Presti hope to operate ship National Glory in coastwise service; notes barriers to AMH	59	http://americasmarinehighways.com/content/view/Q%20AND%20A%20INTERVIEWS/INTERVIEWS%20AND%20DISCUSSIONS/Torey%20Presti%20-%20President%20of%20National%20Shipping%20of%20America%20LLC
MH Potential		Acta Non Verba	Reed Fujii	Record	Article	08/15/09	W		Oakland/Stockton funding by State air quality district	46	
MH Potential		Selling Short Sea		CIB	Report	08/04/09	N		Coalition letter in support of HMT exemption	14	
MH Potential		Resurgence	Rachel Gordon	SF Gate.com	Article	07/03/09	W		Secy LaHood visit to Oakland in support of marine highway	65	http://articles.sfgate.com/2009-07-03/bay-area/17219262_1_trucks-that-move-goods-diesel-pollution-west-oakland
MH Potential		Is Short-Sea Shipping A Serious Alternative?		American Shipper	Article	06/16/09	N		TTI Modal Comparisons paper released	13	
MH Service		Barging Around Houston	Chas Clowdis, Natasha Horowitz	IHS Global Insight	Article	06/05/09	N		Review of advantages and disadvantages of barges	87	http://www.ihs.com/products/global-insight/industry-economic-report.aspx?id=106593483
Emissions		The Green Marine Highway?	Bob Edmonson	Journal of Commerce	Article	05/25/09	N		Freight planning policy legislation is multimodal and could support marine highway related projects	16	
MH Program		The Case Against Short Sea Shipping	Eric Kulisch	American Shipper		04/09/09	N		increased use of intermodal by trucking	23	
MH Plan		Report: Oakland-Sacramento Barging Plan Needs Taxpayer Support	Sean Kilcarr	America's Marine Highways	Essay	04/09/09	N	P	Editor of American Trucker writes about value of MH to trucking	11	http://americasmarinehighways.com/content/view/Q%20AND%20A%20INTERVIEWS/PERSPECTIVES/Sean%20Kilcarr%20-%20Editor%20%20American%20Trucker%20-%20Senior%20Editor%20%20FleetOwner
MH Potential		The Deep Blue Highway	Bob Edmonson	Journal of Commerce	Article	03/30/09	GL		container feeder service potential into the Lakes	20	
MH plan		Horizon Lines Plans Easet Coast Short-sea	David Maccar	Bucks County Courier Times	Article	03/20/09	E		Hovercraft service proposed for Delaware River and region	15	
Vessel Service		The Gulf's Marine Highway	Steve Szkotak	Associated Press	Article	02/22/09	E		MH as a way to mitigate congestion	12	
Vessel Service		Shipper Suspends Container Service	Rich Miller	Professional Mariner	Article	02/01/09	N			24	http://www.professionalmariner.com/ME2/dirmod.asp?sid=420C4D38DC9C4E3A903315CDDC65AD72&nm=Archives&type=Publishing&mod=Publications%3A%3AArticle&mid=8F3A7027421841978F18BE895F87F791&tier=4&id=07031DC211544CF9B4B6B8994A18E5D5
MH vs Trucking		Coastal shipping offers Rx for highway congestion	Dennis Egan	Journal of Homeland Security and Emergency Management	Opinion	01/01/09	N	N	review of MARAD policy report (see reports worksheet of this table and http://www.ihsglobalinsight.com/gcpath/MARADPolicyStudy.pdf)	79	http://www.bepress.com/jhsem/vol6/iss1/42/
AMH Program		Right of Way	Mark Solomon	DC Velocity	Article	01/01/09	N		Trucking industry's use of intermodal rail	5	
AMH Program		DOT to Turn Underused Waterways Into Marine Highways	John Reid Blackwell	Times Dispatch	Article	12/08/08	E/G		On the start of the 64 Express COB project on the James River, Hampton Roads/Richmond.	4	
MH Potential		The Shipping News	John Driscoll	Times-Standard	Article	11/26/08	W		Humbolt Bay ambition for short sea service	8	http://www.times-standard.com/localnews/ci_11078314
AMH Program		US Mounts effort to shift cargo from highways and railroads to ships	Matt Miller	The Deal Newsweekly	Article	10/03/08	W		Stas Margaronis's Santa Maria Shipping proposal	10	http://www.thedeal.com/magazine/ID/020213/features/just-jobs.php
Intermodal		Executives: Short-haul intermodal gains ground	Bob Edmonson	Journal of Commerce	Article	09/22/08	N		about the Deep Blue Highway report	39	
Reader Responses		More Short Sea Shipping Talk	Beth Quimby	Portland Press Herald	Article	07/17/08	E		Columbia Coastal Service stopped after shipper gpes Chapter 11	29	
Vessel Finance		Financing Jones Act Vessel Assets	Robert Poole		Opinion	07/01/08	N	N	Poole finds flaw in Lombardo/Mulligan SSS paper; Poole is a consistent skeptic	37	

APPENDIX C: MARINE HIGHWAY LIBRARY - JOURNALS, PRESS

Subject	Key	Title	Author	Publication	Type	Date	Coast	View	Comment	Art.#	Link
Feeder Service		Great Lakes Expectations	Shearon Roberts	Miami Today	Article	06/05/08	E/G		Container ferry suggested to shift boxes from downtown routes	7	http://www.miamitodaynews.com/news/080605/story7.shtml
Congestion		Which exit to M-95?	Chris Gillis	American Shipper	Article	05/09/08	E/G			1	
Safety		Highway safety, marine style	John Snedeker	Synergy	Opinion	05/01/08	N	P	policy recommendations for MH	40	
Intermodal		Merging Roads for the Modes		Traffic World	Article	04/21/08	G		opening of terminal by Osprey	36	
Freight Policy		Senators take up transport policy	Justin Stares	Lloyd's List	Article	04/09/08	N		IMO agreement to lower sulphur emission limits and the potential effect on coastal shipping in EU	6	
MH Plan		Rolling on the river	Chris Gillis	American Shipper	Article	04/01/08	GL		The challenge of finding a qualified vessel to enter the US coastwise market.	3	
HMT		Maritime Labor, et al Support HMT Legislation	Janet Nodar	Gulf Shipper	Article	01/14/08	G		Gulf services and plans	30	
Modal Comparison		U.S. inland barge interests measure emissions		American Shipper	Article	12/07/07	N			2	
MH Potential		25,000 miles of navigable waterways seen as efficient alternative to truck-clogged US highways	Larry Copeland	USA Today	Article	10/11/07	N			42	
Intermodal		Forging water-trucking links	Dave Farrell	Benedict's Maritime Bulletin	Article	7/1/2007	N	P	overview of marine highway potential	90	http://www.sealaw.org/documents/ShortSeaShipping.pdf
MH Plan		Just jobs	Ken Wykle	Journal of Commerce	Opinion	06/22/07	N	P	Taken from Wykle's Maritime Day address	43	
MH vs Trucking		The Case for Heavier Trucks	Randall Skalberg	Transportation Journal	Article	06/01/07	N		paper on HMT history and as regards MH	47	
MH Plan		Short sea shpiping being pitched by maritime group	Dale DuPont	WorkBoat	Article	06/01/07	N		will federal funding be available to help new service?	44	
Funding		Federal funding sought for short-sea shipping on Miami River	Peter Leach	Journal of Commerce	Article	01/27/07	E/G		unrealized plans	31	
Emissions		Short sea shipping at risk from IMO sulphur laws	Perrry, Weitz, Borgerson	New York Times	Opinion	01/02/07	N	P	they released their report of the same name a year later	32	
Intermodal		Taking it off the streets (and highways)	Higginson/Dumitrascu	Transportation Journal	Article	01/01/07	GL		concludes that bulk and short haul Ro/Ro would work best	45	
MH Service			John Snedeker	Synergy	Opinion	01/01/07	N		thoughts on importance of port terminal developmetn to MH	41	
Jones Act		Breaking into the Jones Act		American Shipper	Article	11/02/06	W		Seaworthy Systems report on COB proposal	33	
Short Sea Bill		Short Sea Provisions in Energy Bill	Peter Lahay	Waterfront News	Opinion	08/01/06	W	P	Canadian ILWU publication; article includes more than SSS discussion	62	www.ilwu.ca/WFN_06_August.pdf
Labor		Hughes Asserts ILA's Place in Short Sea Shipping	Matt Hilburn	Seapower	Article	05/01/06	N		includes interviews of Ron Silva, Ric Armstrong, Mark Yonge, Curtis Whalen	38	

This table is ordered chronologically

KEY
COAST: National, West, East, Gulf, or Great Lakes
VIEW: Is there a positive or negative viewpoint?
PAGE: Page where MH section starts or the subject is mentioned.
COMMENT: Additional description, explanation about document.
LIBRARY: Do we have a hard copy (S) or digital copy (HD)?

APPENDIX D: THE MARCO POLO AND MOTORWAYS OF THE SEA PROGRAMS

BACKGROUND

The Marco Polo Program was adopted by the European Commission in 2003 to "grant financial assistance to improve the environmental performance of the freight transportation system as a source of financing that offers operators on congested roads alternatives by using other modes of transport."[1]

The program and underlying policy emerged from a European transport strategy set out in a 2001 White Paper.[2] The strategy objectives included an improvement in the rail and road systems, promoting sea and waterway transport, making "intermodality a reality," building a Trans-European Transport Network (TEN-T), "striking a balance between growth in air transport and the environment," and others such as improving safety and advancing research and technology.

The objective for sea and inland waterway transport was to develop the infrastructure, simplify the regulatory framework by creating one-stop offices, and integrate the social legislation in order to build veritable "motorways of the sea." The objective for intermodality, or combined transport, was to "shift the balance between modes by means of a pro-active policy to promote intermodality and transport by rail, sea and inland waterway." Enter Marco Polo, the freight program.

MARCO POLO PROGRAM

The First Call for proposals for funding was issued in 2003, followed by three additional calls in each of the following years. Assistance was provided for three types of actions:

- Modal Shift Actions to shift freight from roads to rail or water;
- *Catalyst Actions* to overcome significant structural barriers in the EC market; and
- *Common Learning Actions* to improve cooperation for optimizing methods and procedures in the supply chain.

A mid-term review determined that Marco Polo was "oversubscribed and underfunded" by nearly 5:1.

Marco Polo II was launched for the 2007-2013 period with a budget of EUR 400 million and with additional features. It expanded to apply only to actions of at least two Member States, or a Member State and a nearby third nation. It also added to eligibility for funding:

- *Traffic Avoidance Actions* to integrate transport into the production logistics of businesses to avoid a large percentage of freight on the road, and
- *Motorways of the Sea Actions.*

Marco Polo II applicants "must submit actions in the form of consortiums of at least two undertakings" in at least two nations (and thus cannot be limited to actions in a single Member State).

[1] Regulation (EC) No 923/2009 of 16 September 2009 (Official Journal of the European Union) http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:266:0001:0010:EN:PDF (accessed January 21, 2012)

[2] White Paper: European transport policy for 2010: time to decide (Commission of the European Communities) http://ec.europa.eu/transport/strategies/doc/2001_white_paper/lb_texte_complet_en.pdf (accessed January 21, 2012)

> *"Aid for the launch of actions must be transparent, objective and clearly delimited. Community financial assistance is based on the number of tonne-kilometres transferred from the road to other means of sea or land transport or the number of vehicle-kilometres of road freight avoided. The object is to reward high quality projects. Distortions of competition must be avoided in the selection procedure."*[3]

Project evaluations also include environmental merits and overall sustainability. In 2009 the European Parliament enacted revised regulations to facilitate participation by small and micro enterprises, lower action eligibility thresholds, increase funding "intensity," and simplify procedures.

Metrics play a major role in the EU program. They are used to quantify the projected merits of an application for assistance under Marco Polo. Applicants employ a designated calculator to determine the expected benefits in emissions reduction, kilometers traveled on the road, tons shifted, etc. An Excel-based calculator is employed to determine modal shift and environmental and other external costs savings.

MOTORWAYS OF THE SEA ACTION (MOTS)

The objective of MOTS is to directly shift a portion of freight from road to short sea shipping, or short sea in combination with other modes, to shorten road trips as much as possible. (Example, shipping by vessel freight that would otherwise move between Spain and France via the Pyrenees.)

Financial assistance is limited to up to 35 percent of the total expenditure necessary to achieve the objectives of the action and incurred as a result of it; eligible costs for ancillary infrastructure can be no higher than 20 percent of the total eligible project costs. Assistance toward the cost of "movable assets" is contingent on the obligation to use the assets for the duration of the assistance as defined by the subsidy agreement. Assistance is determined on the basis of ton-kms shifted from road to short sea shipping.

The Motorways of the Sea program requires the dissemination of results and encourages the sharing of best practices. Short sea shipping projects are not limited to MOTS when applying for direct support from the Marco Polo programs. For example, the Modal Shift Action program could be a source. The main difference between the two is that MOTS is specific to marine transportation and is defined as door-to-door services in combination with one or more other modes. Guidelines for the Modal Shifts program are somewhat similar to MOTS. Proposed projects included start-up services, training, and innovation. In the instance of *Modal Shifts* subsidies were awarded of up to 35 percent and 3 years. Assistance for ancillary infrastructure cannot be higher than 20 percent. Modal Shift projects have to meet a minimum threshold of 60 million ton-kms shifted per year over the course of the project agreement. A shift to inland waterways is subject to a special threshold of 13 million ton-kms.[4]

[3] *The Marco Polo II Programme Summary*
http://europa.eu/legislation_summaries/environment/tackling_climate_change/l24465_en.htm (accessed January 21, 2012)
[4] Regulation (EC) No 923/2009

APPENDIX E: M-95 STAKEHOLDER INTERVIEW LIST

FEDERAL, STATE AND LOCAL PUBLIC AGENCIES

- U.S. Department of the Navy
- Massachusetts Dept. of Conservation & Recreation
- Massachusetts Seaport Advisory Council
- New Bedford Economic Development Council
- City of New Bedford, Planning
- New Bedford Regional Airport
- New Jersey Department of Transportation
- North Jersey Transportation Planning Authority
- Gloucester County Department of Economic Development
- Delaware Valley Regional Planning Commission
- Baltimore Metropolitan Council
- Maryland Department of Transportation
- The Richmond (VA) Area Metropolitan Planning Authority
- Southeast Regional Planning & Economic Development District
- Florida Department of Transportation

PORT AND TERMINAL OPERATORS

- Maine Port Authority
- New Bedford Harbor Development Commission
- Port Authority of New York and New Jersey
- South Jersey Port Corporation
- Maryland Port Administration
- Virginia Port Authority
- Canaveral Port Authority
- New York Shipping Association
- APM Terminals
- Global Marine Terminals (NY Container and Global)
- Maritime International
- Ambassador Services

SHIPPERS AND TRANSPORTATION PROVIDERS

- Phoenix Beverage
- Home Depot
- Wal-Mart
- Johnson & Johnson
- Dal-Tile
- Bed, Bath and Beyond/Christmas Tree Shops
- The Limited*
- International Paper*
- STC Marine
- UPS
- CSX
- RailEx
- Raritan Central Railway
- Cape Rail, Inc.
- SeaBridge Freight[1]
- CMA CGM Group
- Intermodal Marine Lines

** Partial response*

[1] Seabridge Freight operated a container on barge service between Brownsville, Texas and Manatee, Florida (Tampa Bay) that ceased in January 2011. Discussions were held with the former President/CEO.

APPENDIX F: STAKEHOLDER OUTREACH DOCUMENTS

SITE VISIT INVENTORY FORM

The locations to be visited must have been previously identified as marine highway sites in material submitted to the US Maritime Administration (MARAD) and be used for services that meet the MARAD definition of "marine highway."

- For international ports, the site visit should focus on those specific locations within the port complex where marine highway vessels are anticipated to dock.
- For locations where marine highway activities are planned but not yet operational, request plans or descriptions of the anticipated facilities be provided to participants.
- Certain information on the site visit inventory sheet can be obtained prior to the visit, including acreage and modal connections.

M95 SITE VISIT INVENTORY

Port/Location Name:

Existing/Proposed Marine Highway Use:

Domestic Only Y/N International Feeder Only Y/N
Combination Domestic/International Y/N

Location	
Street Address	
Town	
County, State	
River, Ocean	
Site Characteristics	
Size of Property	
Length of Waterfront	
Existing Berths/Piers	
Site Conditions	
Brownfield?	
Wetlands?	
On-site Buildings	
Equipment (e.g., cranes)	
Other Considerations	
Site Access	Describe site access, condition and any access limitations. Note rail operators, proximity to terminal and frequency of service. Note type of road access (e.g., proximity to interstate or major roads).

Roadways	
Rail	
Waterside	
Depth of Channel	
Marine Activity	Describe operations, vessel types, operators, cargo types, commodities
Current Use	
Domestic	
International	
Planned Improvements/New Operations	
Site Ownership	
Owner(s)	
Operator(s)	
Surrounding Land Uses and Proximity	
Industrial	
Residential	
Recreational	
Schools	
Office	
Retail/Hotel	
Sustainability	Describe any aspects of the facility that are designed and/or marketed as environmentally beneficial

Other Notes:

M95 Agency Discussion Guide

Introduction

These interviews are being conducted at the beginning of the M95 project to inform our understanding of how agencies in the I-95 Corridor perceive and work with marine highway options. Our discussions with selected public agencies, along with similar discussions with shippers, will help set the stage for three listening sessions involving the broader community of stakeholders.

Marine highway freight operations include the waterborne movement of containers, trailers, and railcars, along with such items as structural steel, precast concrete and other non-bulk shipments. Bulk shipments, which include movements of grain, petroleum products and municipal solid waste are currently not included in the USDOT definition.

Marine highway efforts involve the domestic movement of cargo. Movements can include waterborne movement of cargo between two or more US locations, as well as marine highway services that link overseas cargo handled at international ports with other US locations.

Background on Agency

1. Please tell us about your organization:
   - Type of Organization (MPO, state agency, port agency, etc.)
   - The Geographical Area that your agency is responsible for.
   - Your Organizational Goals and Objectives
   - Your responsibilities (e.g., regulatory, investment/funding, construction, operation, planning, etc.)
2. What other public agencies do you most often work with regarding transportation and economic development initiatives?

Freight Movement

3. Please describe the freight activity in your area, including the levels of activity and major facilities in your area. We are interested in both international and domestic freight movements.
4. Please describe your agency's roles and responsibilities regarding freight movement in your area, including the modes that your agency covers.
5. Do you have any specific goals relative to freight mobility/system performance in your region?
6. Does your agency also handle passenger transportation initiatives and operations?
7. What are the top three trends and considerations that your agency sees as affecting freight movement in your area?
8. Has your agency undertaken analyses of how freight modal choices are made? If yes, what conclusions have these analyses indicated?
9. Have you identified any freight related bottlenecks in your area? If yes, have you identified the implications?

10. What are the five leading freight related projects currently being undertaken by your agency?

Marine Highway

11. Do you have any specific goals related to Marine Highway Operations to address freight mobility/system performance within your jurisdictional area and/or enhance economic development?

12. Do marine highway operations currently exist in your area? If yes, please describe. If not, are marine highway operations being developed or planned? If yes, please describe

13. If marine highway operations exist or are planned, can you please identify the sites and whether these locations are included in any current MARAD marine highway initiatives

14. Is the agency currently directly involved in marine highway activities or development? Y/N

15. If yes, please describe the agency's activities related in marine highway.

16. What industries or business clusters does your agency envision as customers for marine highway operations in your area? Can you please provide names and contacts to be considered for industry perception surveys?

17. Has your agency collected any data related to potential marine highway activity, including commodities, origins/destinations, etc.? If yes, can you please share this information with the M95 team?

18. What questions does the agency most want answered regarding marine highway operations?

Wrap Up

19. Are there additional considerations related to marine highway operations and your region that we know for the M95 project?

20. Can your agency please provide us with a list of public and private organizations (along with contact information) that should be invited to participate in our listening sessions?

SHIPPER PERCEPTION SURVEY

1. What are the four top considerations in your use of freight transportation options, such as truck, rail, ocean and air services:
    a. Cost
    b. Reliability
    c. Time Involved
    d. Security of the Shipment/Shrinkage
    e. The Freight Modes Used
    f. Use of "Green"/Sustainable Transportation Options
    g. Tracking
    h. Other:
2. What performance measures do you apply to yourself and the transportation providers you engage?
3. Under what circumstances would you consider switching from your current shipment mode(s) to an alternative mode?
4. Have you heard about marine highway options before this interview? Y/N
5. If yes, does your organization currently use any form of marine highway service in your network? If yes, can you please tell us about your experience?
6. What would you need to know about marine highway service options before your organization would consider using a marine highway service?
7. What service criteria would be most important to you in considering using marine highway services?
8. Are there any factors that would cause your organization to eliminate marine highway service as a shipping option?
9. What questions does the organization most want answered regarding marine highway operations?
10. Are there additional considerations related to marine highway operations and your company's freight needs that we know for the M95 project?

LISTENING SESSION DISCUSSION GUIDE

"CHICKEN & THE EGG: DERIVING SERVICE FROM DEMAND"

The purpose of this discussion topic is to determine what market and other forces are necessary to exist in a given area in order for a carrier to begin serving a given market. While we know the demand exists for Marine Highway services and there is substantial excess capacity in the system, how do we translate those known factors into an actual service that is sustainable?

- Can demand spark short sea services, or do short sea services need to exist before shippers start using?
- What does it generally take to start short sea services; e.g., Government funding/private participation?
- Where can marine highway services be incorporated into the supply chain in the respective marine highway corridor?
- What types of intermodal infrastructure/equipment are lacking in areas where Marine Highways make sense?

"SEAMLESS INTERMODAL INTEGRATION"

The purpose of this discussion topic to develop the framework under which we can seamlessly connect truck, rail, and marine highway services. The focus should be on both hard infrastructure and administrative requirements such as thru bills of lading, etc. which provide a single point of transportation interface for the shipper.

- How can truck, rail, and marine highway services partner and provide a seamless transition for cargo traveling across modes along the system?
- What can contribute to improving intermodal coordination which would provide visibility and reliability to the shipper?
- Can state regulations and lack of infrastructure development be impediments, notably between states?
- Do natural impediments like geographic/topographic issues make a difference?
- Is urban congestion a factor yet? If not, at what point does it become a factor?
- Is fuel anticipated to become a factor such that cargo shifts to water?

"OPTIMIZING DOOR TO DOOR PRICING"

The purpose of this discussion topic is to determine how we can configure pricing structures for marine highways that provide door-to-door service that can be competitive with direct truck and rail shipments. The discussion should also focus on how marine highway services can partner with trucking companies where it makes sense to allow trucking companies to better leverage their assets.

- What pricing structures can be developed to provide incentives to shippers and 3PLs to use marine highway services?

- What partnerships and/or synergies can be developed with drayage companies to reduce the overall cost of providing door to door service?

- How can overall vessel costs be reduced?

- How can overall door to door costs be structured more efficiently?

"PUBLIC/PRIVATE RELATIONSHIPS"

The purpose of this discussion topic is to determine where and under what conditions federal, state, and local government can partner with private entities to promote, initiate, and/or sustain Marine Highway services.

- How could distribution centers take better advantage of America's Marine Highway?

- Can ITS – electronic communication between water and truck services – facilitate short sea service utilization? If so, how?

- Would shipper tax credits help spark the use of short sea services?

- How else can government and industry further develop partnerships?

- Can marine highway services help improve livability in communities?

- Can marine highway services be leveraged by local government to attract manufacturing and distribution?

"FINANCIAL INCENTIVES & INITIATIVES"

The purpose of this discussion topic is to determine what, other than removal of HMT and Jones Act, should federal, state, and local government do to create a financial environment under which marine highway services can thrive.

- What funding mechanisms do you think are critical to starting marine highway services, including those to better integrate modes?

- Do shipper tax credits help spark the use of Marine Highway services?

- Is it more effective to incentive marine highway services or dis-incentivize other modal services to spur demand for more efficient means of goods movement?

- Should marine highway public benefits (e.g., emissions reduction) be quantified and reflected in shipping rates to understand the true value of marine highway services?

- Should a carbon tax be imposed on shippers or carriers?

The Freight Analysis Framework, Version 3: Overview of the FAF3 National Freight Flow Tables

PREPARED FOR:
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Under Contract No. DE-AC05-00OR22725

TABLE OF CONTENTS

1. Introduction

1.1 Purpose of This Document

This document provides an overview of how the origin-destination-commodity-mode (ODCM) annual freight flows matrix developed under the Freight Analysis Framework, Version 3 (FAF^3) program. FAF^3 is a Federal Highway Administration (FHWA) funded and managed data and analysis program that provides estimates of the total volumes of freight moved into, out of and within the United States, between individual states, major metropolitan areas, sub-state regions, and major international gateways. The FAF^3 database is constructed by Oak Ridge National Laboratory (ORNL). Staff at MacroSys contributed to the development of a number of industrial sector-specific commodity flow estimates. Staff at Battelle Memorial Institute, and at IHS Global Insight have also developed FAF^3 data products that derive from the 2007 freight flow matrices described in this report.

This present document is devoted to describing how the base year, 2007 annual tonnage and dollar valued flows are estimated in the FAF^3 ODCM matrix. The document is labeled an overview because a detailed description of the flow matrix building procedure is very lengthy. This present document should suffice the majority of readers interested in knowing the basics of where the flow estimates come from. More detailed descriptions of specific flow estimation components are provided for those wishing to go further into the process. Separate FAF^3 documents also describe how these flows are projected into future years, and how these base and forecast year flows are then converted into vehicle/vessel traffic volumes and assigned to (i.e. routed over) individual links and routes within the US national highway, rail and waterway networks.

1.2 FAF^3 Data Products

FAF^3 data products are the result of merging datasets from a large number of different sources. The principal data products developed under the FAF^3 umbrella are the following:

- A set of annual freight flow matrices, reported in annual tonnages and annual dollar value of goods transported, for calendar year 2007 for the United States,
- Based on these base year flow estimates, a set of forecast year freight flow matrices, projected out to calendar year 2040,
- A set of annual freight tonnage and vehicle/vessel movement volumes assigned to specific links and routes over the United States multimodal truck-rail-waterways transportation network, based on these base year 2007 and forecast year 2040 flow estimates.

Based on these estimated freight flows and their network assignments, a set of annual freight tonnage, dollar value, and ton-mileage statistics, broken down by mode of transport and commodity class are also developed.

Figure 1.1 show the functional linkage between these various FAF^3 data products, starting with the creation of the calendar year 2007 FAF^3 national freight flows matrix. Also shown in Figure 1.1 is a new data product coming out of the FAF^3 effort. This is not a data set per se, but an on-line, web-based tool for extracting data elements from the FAF^3 database and constructing useful data tables on a regional, modal and/or commodity specific basis.

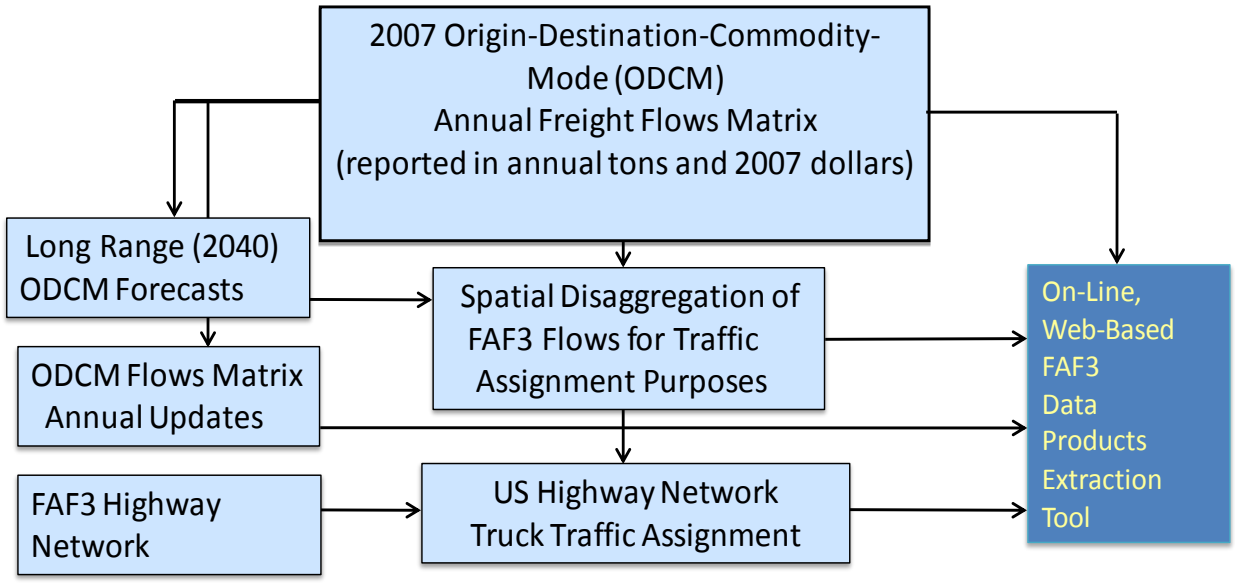

Figure 1.1 Principal FAF^3 Data Products

Freight origin-to-destination (O-D) movements are estimated in FAF^3 on both an annual tonnage and annual dollar value basis, for calendar year 2007. These estimates are then used as the basis for developing both annual *provisional* updates and as the starting point for a set of longer-range freight movement forecasts, reported at five year intervals from 2015 out to year 2040. The principal dimensions of these *FAF^3 Freight Flow Matrices* are:

- Shipment origination region (O),
- Shipment destination region (D),
- The class of commodity being transported (C), and
- The mode of transportation used (M).

The FAF^3 freight flows matrix is made up of 131 Origin (O) x 131 Destination (D) x 43 Commodity Class (C) x 8 Modal Category (M) data cells, for each of 2 reporting metrics, annual tons and annual dollar values.

1.3 Links to Technical Documentation

FAF^3 is the third database of its kind, with the FAF^1 database providing similar freight data products based on calendar year 1997 data, and FAF^2 providing freight data products based on calendar year 2002 data. Since the very first FAF effort, a number of changes in both data

products and in the sources of the data used to produce them have taken place. A description these earlier data products, along with the FAF^3 data products, can be found at the following FHWA website:

http://www.ops.fhwa.dot.gov/freight/freight_analysis/faf/index.htm

This site also guides the user to the *FAF^3 on-line Data Extraction Tool*, which can also be accessed directly at:

http://cta-gis.ornl.gov/faf/

At this site a user can customize and download a variety of fright flow tables directly from the FAF^3 database. Interactive links are also provided to FAF^3 Data Documentation, Data Summary, and maps.. Users can also download the entire FAF^3 2007 regional database in either Microsoft Access 2003 (125MB) or in CSV (100MB) format.

1.4 Improvements in Reporting Introduced with FAF^3

With this latest version of the FAF a number of improvements to the commodity flow matrix have been possible over previous versions. These include:

- A roughly doubling of the number of U.S. shipping establishments sampled as part of the 2007 U.S. Commodity Flow Survey (from some 50,000 establishments in 2002, to approximately 100,000 establishments surveyed in 2007);[1]
- The use of PIERS data to support improved estimates of the internal to the U.S. allocations of imports and exports to FAF domestic zones of freight origination (for U.S. exports) and destinations (for U.S. imports);
- Incorporation of additional federal datasets within an improved FAF^3 log-linear modeling/iterative proportional fitting algorithm, as well as the development of the Out-of-Scope estimates;
- Greater use of U.S. inter-industry input-output ('use' and 'make') coefficients in the development of the FAF^3 out-of-scope (to the 2007 CFS) commodity flow estimates;
- FAF^3 provides an O-D specific treatment of natural gas products, which were evaluated only at the level of national or broad regional activity totals in FAF^2; and
- The ability to access FAF^3 data products via a user friendly web-based data set construction and download tool (cf. Section 1.3 above).

[1] For changes in the CFS between 2002 and 2007 see the following Bureau of Transportation Statistics website: http://www.bts.gov/help/commodity_flow_survey.html#diff_2007_2002

2. FAF^3 Geography, Commodity and Modal Classes

2.1 Geography

The 2007 CFS commodity flow tables are based on a revised geography that contains 11 additional traffic analysis regions, for a total of 123 domestic regions in all. FAF^3 uses the same geography. Figure 2.1 shows the boundaries of the 123 domestic FAF^3 flow analysis regions, also referred to as FAF^3 analysis zones.

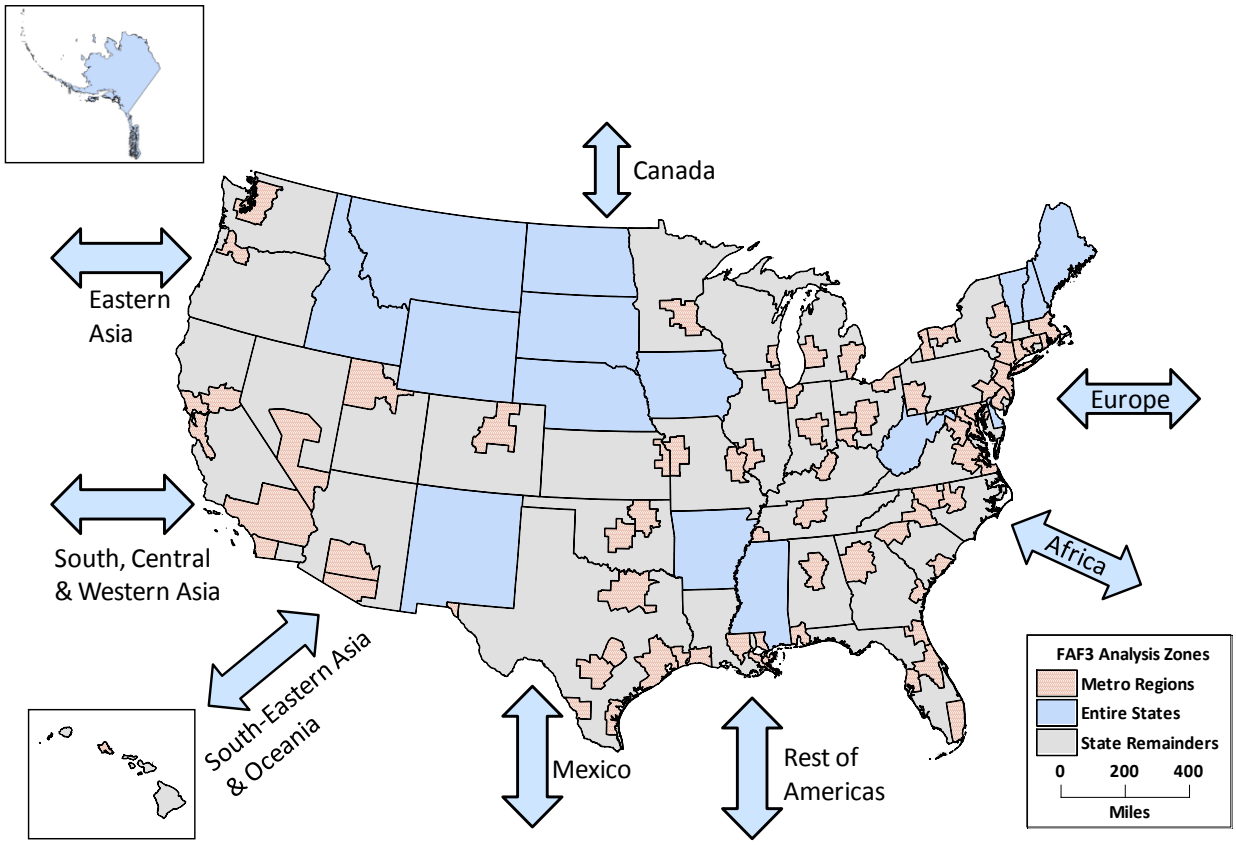

Figure 2.1 FAF^3 Geography

Three subsets of regions are highlighted: 74 metropolitan area determined regions, 33 regions made up of state remainders, representing a state's territory outside these metropolitan regions, and 16 regions identified as entire states, within which no FAF^3 metropolitan regions exist.

Note that metropolitan regions do not cross State boundaries: so that the Chicago, Kansas City, Philadelphia, and St. Louis metros are split into two state-specific FAF^3 regions, while the New York and Washington metropolitan areas are split into three distinct zones. To avoid crossing State boundaries the metropolitan areas of Atlanta (GA), Boston (MA), Charlotte (NC), Louisville (KY), Memphis (TN), Minneapolis-St. Paul (MN), Portland (OR), Providence (RI), Sacramento (CA), and Virginia Beach (VA) are each defined by the state in which most of the

metro areas' population resides and economic activity takes place. Also shown in Figure 2.1 are the 8 world regions that act as the origination and destination points for U.S. exported and imported freight. In addition to flows between the U.S. and Canada and the U.S. and Mexico, flows between the U.S. and the remaining six foreign FAF[3] regions are based on an allocation of countries to their respective United Nations geographic region.[2]

2.2 Commodity Classes

FAF3 reports annual tonnage and dollar valued freight flows using the same 43 2-digit Standard Classification of Transported Goods (SCTG) classes used by the 2007 U.S. Commodity Flow Survey (CFS).

Table 2.1 FAF[3] Commodity Classes

SCTG	Commodity	SCTG	Commodity	SCTG	Commodity
01	Live animals/fish	**15**	Coal	**29**	Printed products
02	Cereal grains	**16**	Crude petroleum	**30**	Textiles/leather
03	Other agricultural products.	**17**	Gasoline	**31**	Nonmetal mineral products
04	Animal feed	**18**	Fuel oils	**32**	Base metals
05	Meat/seafood	**19**	Coal-n.e.c.	**33**	Articles-base metal
06	Milled grain prods.	**20**	Basic chemicals	**34**	Machinery
07	Other foodstuffs	**21**	Pharmaceuticals	**35**	Electronics
08	Alcoholic beverages	**22**	Fertilizers	**36**	Motorized vehicles
09	Tobacco prods.	**23**	Chemical prods.	**37**	Transport equipment
10	Building stone	**24**	Plastics/rubber	**38**	Precision instruments
11	Natural sands	**25**	Logs	**39**	Furniture
12	Gravel	**26**	Wood products	**40**	Misc. mfg. products.
13	Nonmetallic minerals	**27**	Newsprint/paper	**41**	Waste/scrap
14	Metallic ores	**28**	Paper articles	**43**	Mixed freight
				99	Commodity unknown

[2] See http://unstats.un.org/unsd/methods/m49/m49regin.htm for these country-to-region allocations.

2.3 Transportation Modes

FAF[3] flows are also broken down by 8` modes of transportation. Table 2.2 lists these mode and commodity classes.

The "multiple modes and mail" category includes truck-rail, truck-water, and rail-water intermodal shipments involving one or more end-to-end transfers of cargo between two different modes. Detailed SCTG code definitions can be downloaded at either of the following Census and Bureau of Transportation Statistics websites:

http://www.census.gov/svsd/www/cfsdat/2002data/cfs021200.pdf

http://www.bts.gov/publications/commodity_flow_survey/survey_materials/pdf/sctg_booklet.pdf

Appendix A describes how these CFS-based regional, modal, and commodity class definitions differ from those used by FAF[2].

Table 2.2 FAF[3] Mode Classes

Mode Identification	Mode Name	Mode Description
1	Truck	Includes private and for-hire truck. Private trucks are owned or operated by shippers, and exclude personal use vehicles hauling over-the-counter purchases from retail establishments.
2	Rail	Any common carrier or private railroad.
3	Water	Includes shallow draft, deep draft and Great Lakes shipments.
4	Air (includes truck-air)	Includes shipments typically weighing more than 100 pounds that move by air or a combination of truck and air in commercial or private aircraft. Includes air freight and air express. Shipments typically weighing 100 pounds or less are classified with *Multiple Modes and Mail*
5	Multiple Modes and Mail	Includes shipments by multiple modes and by parcel delivery services, U.S. Postal Service, or couriers. This category is not limited to containerized or trailer-on-flatcar shipments.
6	Pipeline	Includes flows from offshore wells to land, which are counted as water moves by the U.S. Army Corps of Engineers.
7	Other and Unknown	Includes flyaway aircraft, vessels, and vehicles moving under their own power from the manufacturer to a customer and not carrying any freight, unknown, and miscellaneous other modes of transport.
8	No Domestic Mode	A 'No Domestic Mode' category is used to capture petroleum imports that go directly from foreign, inbound ships to an on-shore US refinery. This is done to ensure a proper accounting when foreign and domestic flows are summed, while avoiding assigning flows to the domestic transportation network that do not use it.

3. The Flow Matrix Construction Process

3.1 Overview

The FAF[3] modeling process draws from many data sources but the most important is the U.S. Commodity Flow Survey.(CFS). Figure 3.1 shows the principal types of data used to construct the FAF[3] ODCM freight flows matrix. This matrix construction process begins with the data reported by the 2007 CFS[3], adopting both the CFS definitions for the 123 internal to the U.S. freight analysis zones and the same 43 SCTG 2-digit commodity classes, but using a modification of CFS modal definitions. Each of these three data dimensions is elaborated on below.

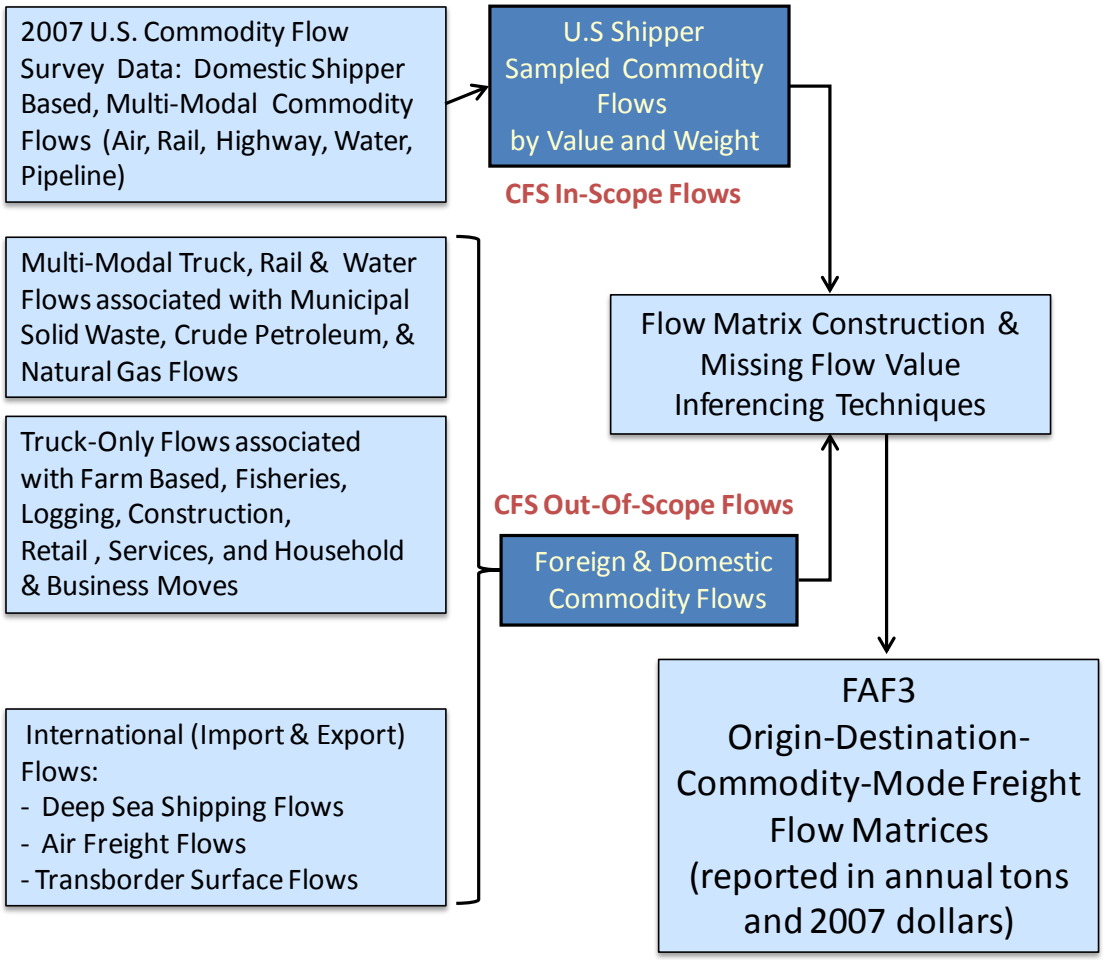

Figure 3.1 Overview of the FAF[3] Freight Flow Matrix Construction Process

[3]For the details of how the 2007 CFS survey methodology, and for on-line access to the public domain CFS data products , go to: http://www.bts.gov/publications/commodity_flow_survey/

The CFS itself is conducted every 5 years as part of the U.S. Economic Census, with major funding for the survey provided by the Bureau of Transportation Statistics (BTS). Data are collected on all shipments from the surveyed establishment for an entire week in each of the four quarters of the census year. In 2007, about twice as many establishment samples were recorded as in 2002.

The CFS represents the best basis for FAF construction because it provides shipper sampled, and subsequently expanded estimates of both tons shipped and dollar value trades within and between all US regions for all modes of freight transportation. However, the CFS has a number of well researched weaknesses that require considerable additional effort in order to construct a complete accounting of freight movements within the United States (see TRB, 2006). First, the CFS does not report imports, while CFS reporting of export flows is also subject to data quality issues resulting from limited sample size. Second, the CFS also either does not collect data from the following freight generating and receiving industries, or collects insufficient data to cover the industries in a comprehensive manner:

- Truck, rail and pipeline flows of crude petroleum, and natural gas,
- Truck freight shipments associated with farm-based, fishery, logging, construction, retail, services, municipal solid waste, and household and business moves, and.
- Imported and exported goods transported by ship, air, and trans-border land (truck, rail) modes.

In FAF^3 these industries produce what are referred to in Figure 3.1 as Non-CFS or Out-Of-Scope (OOS) to the CFS freight flows. Their estimation requires a good deal of data collection and integration into the larger flow matrix generation process. The data sources for these OOS flows are for the most part derived from freight carrier reported data sources, in some cases requiring the use of secondary or indirect data sources, such as location specific measures of industrial activity, employment or population, to allocate flows to specific geographic regions. These OOS flows represent some 32% of all U.S. freight movements measured on an annual tonnage basis. Developing OOS flow estimates represents a considerable effort, with different commodity classes requiring very different, typically multi-step treatments: including the use of both spatial and commodity class "crosswalks" that convert mode and industry class specific estimates from their native coding categories into FAF^3 regional and commodity class breakdowns.

3.2 Modeling to Enhance CFS In-Scope Flows

3.2.1 CFS Data Gaps and Data Tables

The 2007 CFS is a large and very sparse matrix of annual tonnage and dollar valued freight shipment volumes, with many individual cells assigned a value of value of zero tons and zero dollars of freight shipped during the calendar year. The complete set of 2007 CFS data products

includes a large number of different data matrices.[4] This includes the most detailed of the published matrices, Table CF0700A25, which reports annual tons, dollar values, and also ton-miles shipped by state of origin, state of destination, mode and 2-digit commodity class.[5] Although these are the four flow dimensions needed for the FAF this matrix contains many data gaps, and reports only state-to-state shipment totals that need to be assigned in some manner to FAF region-to-region flows. Fortunately, other CFS tables provide 1, 2 and 3 dimensional looks at this same data, including marginal totals at the FAF regional level that do not suffer to the same extent from data suppression. Without going through the contents of each CFS data table in turn, these gaps in the 2007 CFS coverage can be summarized as follows:

- Annual O-D commodity flow estimates exist but some are missing either a modal or commodity breakdown, or both,
- Modal share estimates exist but lack the geographic and/or commodity detail required of the FAF^3 flows matrix, and
- Data on shipment lengths exists, by mode and/or commodity, but with little or no linkage to either State or FAF^3 regional O-D geography.

In many instances data is missing or suppressed at the 2- or 3-, as well as 4-dimensional level of flow resolution. That is, we have a flow matrix that contains a variety of levels of coverage, with many data gaps needing to be filled.

While many of these zero valued cells are accurate, CFS sample size limitations may also be responsible for missing some of these flows at the origin-destination-commodity-mode level of resolution sought by the FAF; or for creating flow estimates that have such high variability (sampling error) that the US Census Bureau chose to suppress their values. Where such suppression occurs in the CFS a cell value has been replaced by the letter 'S'. In some cases 'S' reported cells may represent quite large freight flows in the real world, because a large coefficient of variation does not necessarily mean that we have only small O-D flows to deal with. For FAF reporting purposes an estimate is desired for these suppressed cell values, and also for any zero valued cells where limited CFS sampling has failed to produce a positive flow estimate, but where freight is likely being shipped.[6] The question the FAF has to answer is not

[4] http://www.bts.gov/publications/commodity_flow_survey/ Click on "Interactive tables."
[5] http://www.census.gov/svsd/www/02CFSdata.html
[6] Reporting of individual CFS cell values may also be suppressed to avoid disclosing information about an individual company's activity. For the CFS, the primary method of disclosure avoidance is Noise Infusion: Noise infusion is a method of disclosure avoidance in which values for each shipment are perturbed prior to tabulation by applying a random noise multiplier. Disclosure protection is accomplished in a manner that causes the vast majority of cell values to be perturbed by at most a few percentage points. In certain circumstances, some individual cells may be suppressed on a case by case basis for additional disclosure avoidance purposes. Such cell values have their flow values replaced by the letter 'D' in published CFS tables.
http://www.bts.gov/publications/commodity_flow_survey/def_terms/index.html#samplingerror

only what size each of these flows should be, but also, which of the many zero valued cells ought to contain a positive flow at all.

3.2.2 Log-Linear Modeling of Missing Cell Values

The procedure used for estimating these missing cell values is shown in Figure 3.2. This figure is a high level treatment of the problem. The following description provides an overview of the major data steps in this data modeling process.

In FAF^3, missing 2007 CFS cell values are first of all estimated using a six-dimensional log-linear model. The first four of these dimensions are the above-defined FAF origin region (O), FAF destination region (D), FAF commodity class (C) and FAF mode of transport (M). To this are added two additional dimensions:

- A 'freight metrics' dimension, U, defined by the two classes of metric reported by the CFS, i.e. tonnage (u =1) and dollar value of freight moved (u = 2); and

- A data source' dimension, S, that captures four different classes (= sources) of freight flow estimates, i.e. the 2007 CFS (s = 1), the 2002 CFS (s =2), the 2007 Railcar Waybill dataset (s = 3), and the 2007 Waterborne Commerce dataset (s = 4).

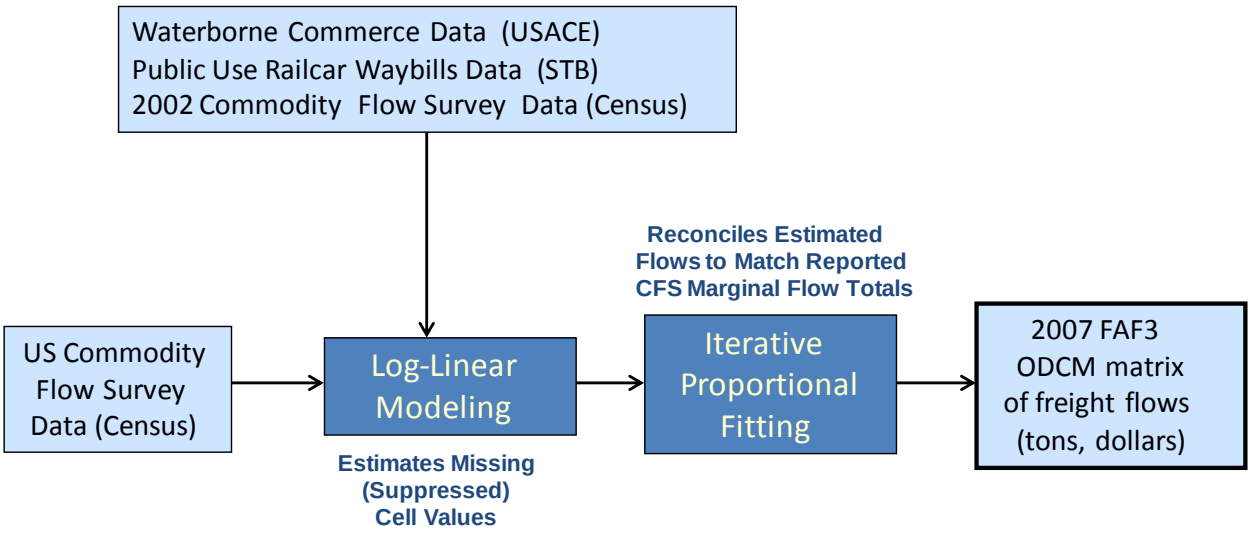

Figure 3.2 Estimation of Missing Cell Values in the 2007 US Commodity Flow Survey

Zero valued cells in the 2007 CFS can be categorized as either "structural" or sampling zeros. For example, truck commodity flows between Hawaii and mainland US regions is an obvious structural zero. Sampling zeros are divisible two types:

1. Cells where no sample data was obtained by the 2007 CFS, but flows may exist; and

2. Cells where the volume of freight sampled was so small that it fell below the CFS reporting threshold, i.e. below 500 tons, or below half a million dollars, and was therefore rounded down to '0' in the CFS published tables.

In particular, a large number of CFS cells have had their value suppressed, for either confidentiality or statistical robustness reasons. For example, cell values are suppressed reported in the 2007 CFS if the coefficient of variation associated with the cell estimate exceeds 50%. The method used for estimating these suppressed, and therefore, missing cells values in the CFS flow matrix is a combination of log-linear modeling (LLM) and iterative proportional fitting (IPF). This LLM/IPF procedure was selected because it has the following characteristics:

1. It makes extensive use of existing data within the matrix in the estimation of missing cell values,

2. It offers the ability to fill in missing cell values while maintaining reported marginal flow totals and observed cell values across all dimensions of the matrix,

3. It has the ability to handle missing values at multiple levels of data aggregation, and

4. It offers the ability to bring different, including non-CFS sources of flow estimates, into the solution, including completely new one, two, and three-dimensional data tables, as needed.

This last characteristic has been exploited extensively for the first time in developing the FAF^3 freight flows matrix, and represents a major enhancement to the modeling process used in the previous flow matrix generation process. Specifically, flows reported by two carrier-reported, mode specific datasets are used to help the FAF^3 flows matrix capture potentially missing or under-represented flow estimates. These are:

1. Calendar year 2007 annual rail flow volumes (tonnages) reported in the Surface Transportation Board's (STB) public use railcar waybills[7], and

2. Calendar year 2007 annual flow volumes (tonnages) reported in the US Army Corps of Engineers Waterborne commerce dataset.[8]

In addition, data from the 2002 CFS is also used to look for potentially positive, but zero valued (i.e. sampling zero) flow cells.

In practice, each of these data sources is treated as a component of a sixth dimension in an expanded FAF^3 freight flows matrix.[9] Where a positive cell value is reported in any of these data

[7] Accessible via http://www.stb.dot.gov/stb/industry/econ_waybill.html
[8] Accessible via http://www.iwr.usace.army.mil/ndc/data/data1.htm
[9] By housing these alternative modal data sources within a single dimension of the matrix in this manner we are also allowing, without loss of generality, for the application of more sophisticated across the board CFS + non-CFS weighting schemes in the future.

sources, these cells are subsequently assigned a positive value by the LLM/IPF routine, from which a maximum likelihood estimate of that flow's volume is estimated.

The complete FAF^3 commodity flow model, referred to as the "Log-Linear Model" in Figure 3.2, has the following form:

$$\begin{aligned}\text{Ln}(F^{ODCMUS}) = {} & \lambda_0 + \lambda^O + \lambda^D + \lambda^M + \lambda^C + \lambda^U + \lambda^S + \lambda_j^{OD} + \lambda^{OC} + \lambda^{OM} + \lambda^{OU} + \lambda^{DC} + \\ & \lambda^{DM} + \lambda^{DU} + \lambda^{CM} + \lambda^{CU} + \lambda^{MU} + \lambda^{OS} + \lambda^{DS} + \lambda^{CS} + \lambda^{MS} + \lambda^{US} + \lambda^{ODC} + \lambda^{ODM} + \lambda^{ODU} + \lambda^{OCM} \\ & + \lambda^{OCU} + \lambda^{OMU} + \lambda^{DCM} + \lambda^{DCU} + \lambda^{DMU} + \lambda^{CMU} + \lambda^{ODS} + \lambda^{OCS} + \lambda^{OMS} + \lambda^{OUS} + \lambda^{DCS} + \lambda^{DMS} + \\ & \lambda^{DUS} + \lambda^{CMS} + \lambda^{CUS} + \lambda^{MUS} + \lambda^{ODCM} + \lambda^{ODCU} + \lambda^{ODCS} + \lambda^{ODMU} + \lambda^{ODMS} + \lambda^{ODUS} + \lambda^{OCMU} + \lambda^{OCMS} \\ & + \lambda^{OCUS} + \lambda^{OMUS} + \lambda^{DCMU} + \lambda^{DCMS} + \lambda^{DCUS} + \lambda^{DMUS} + \lambda^{CMUS} + \lambda^{ODCMU} + \lambda^{ODCMS} + \lambda^{ODMUS} + \\ & \lambda^{ODCUS} + \lambda^{OCMUS} + \lambda^{DCMUS} + \lambda^{ODCMUS}\end{aligned}$$

where Ln(F^{ODCMUS}) is the model estimated natural log (log to the base e) annual volume of commodity 'C' moved by mode 'M' between FAF^3 origin zone 'O' and FAF^3 destination zone 'D' in 2007, measured in units 'U' (i.e U=1 for annual tons, U=2 for annual dollar value of the freight moved), and found in data source 'S' (e.g. S = 1 for CFS 2007, S=2 for CFS 2002, S= 3 for 2007 Railcar Waybills, and S = 4 for 2007 Waterborne Commerce).

The λ's represent the model parameters to be estimated, often termed the (natural log of the) *effects* of the different dimensions, or combinations of dimensions, on the resulting flow estimates. For example, λ^{OM} represents the effect of shipment origin O and mode M, λ^{ODCM} represents a four-way, O,D,C,M interaction effect, and λ_0 represents the grand mean of all these effects. Parameters representing all possible levels and combinations of the matrix dimensions O,D,C,M,U and S are used to fit the data to what is usually termed a *saturated* model that tries to get the most out of the statistical relationships represented by the data sources. This equation is translated into an additive, natural log form for solution (i.e. for computational) purposes. In practice, many of the λ's are set to a value of 0.0. For example, since both the 2007 railcar waybill and waterborne commerce flows are only reported in tons, all dollar valued λ's associated with these two data sources = 0.0 and play no further part in the estimation process.

3.2.3 Iterative Proportional Fitting (IPF) to CFS Marginal Totals

Once all of the log-linear model's λ *effects* have been computed, they are used to generate a positive value of each zero valued flow cell in the original 2007 CFS commodity flow matrix. In each case, where a zero valued cell is found it is replaced with an estimate based on the above multiplicative log-linear model. Three additional steps are then taken:

1) Cells considered to be structural zeros are returned to a value of 0.0.

2) To further assist with filling in of missing CFS cell values, an additional dataset was provided by the U.S. Bureau of the Census. This is a matrix containing the number of establishments

sampled within each ODCM cell in the matrix, i.e. a set of raw sample responses. If one or more positive responses are identified for a specific cell, then this is taken to imply the presence of some freight movement activity, and it is therefore treated as a sampling zero for the purpose of cell value estimation.

3) A third modification to process then involves the removal of unreasonable dollar per ton estimates caused by biased or limited sampling, in which either the tonnage or the dollar value allocated to a particular cell by the log-linear/IPF modeling process creates a dollar-per-ton ratio that exceeds expected values for the commodity class in question by a significant amount. To prevent this from occurring, a check is made every ten iterations of the IPF to look for such outliers. If one or more are found, an adjustment is made to either the tonnage or dollar value in such a cell and the iterative process re-commenced.

The resulting matrix (now with no missing values) is then adjusted through IPF to comply with known control totals from numerous CFS marginal tables. It is important to note here that after the full LLM/IPF procedure is completed, no 2007 CFS ODCM or higher (3 or 2 dimensional) marginal cell value has been changed if it contained a positive flow value to begin with. Only potentially missing valued cells (of which there are many) are altered by the process.

3.3 Data and Modeling of Non-CFS (Out-of-Scope) Flows

3.3.1 Domestic Flows

U.S. freight shipping establishments in the following industrial sectors were not surveyed as part of the 2007, or previous, US Commodity Flow Surveys. The following out-of-scope (OOS) industries therefore had to be assigned commodity and mode specific O-D flows using other methods:

1. Farm Based	6. Retail
2. Fishery	7. Household and Business Moves
3. Logging	8. Municipal Solid Waste
4. Construction	9. Crude Petroleum
5. Services	10. Natural Gas Products

OOS flows were estimated using commodity specific datasets and different computational methods for each industrial class. Where an industrial sector produces O-D flows in more than one commodity class, data from national inter-industry input-output "use" and "make" tables was used to determine how much freight each sector contributes to a specific set of SCTG 2-digit commodity flows. State and county level data on volume of production, industrial or commodity specific sector sales, or industrial sector employment is then used to allocate flows between origins and destinations. Spatial allocation formulas are then used to produce O-D flow volumes. Where truck movements were concerned this occurred in one of two ways. Either county level origin and destination activity totals were determined, and then a spatial interaction model was applied to these county productions and attractions, with subsequent aggregation of inter-county

flows back up to FAF^3 region-to-region flow totals. Or county Os and Ds are first of all estimated and aggregated to their FAF^3 regional supply and demand totals. These regional totals are then used to estimate O-to-D flows directly at the FAF^3 region-to-region level.

The specific form of spatial interaction model used also varied by commodity class. Either a distance decay coefficient is calibrated against an empirically derived average shipping distance, or a simple allocation is made based on market potentials (i.e. on the relative size of a county's or region's demand for a specific commodity). County-level spatial interaction modeling here allows for cross-county flows to be captured that are also cross-FAF^3 adjacent regional flows. Use of regional O and D shipment totals prior to spatial interaction modeling occurred where data sources proved more reliable at this less detailed level or geography.

Figure 3.3 shows the general idea. In practice, each industrial sector has its own data gaps and idiosyncrasies that needed to be dealt with.

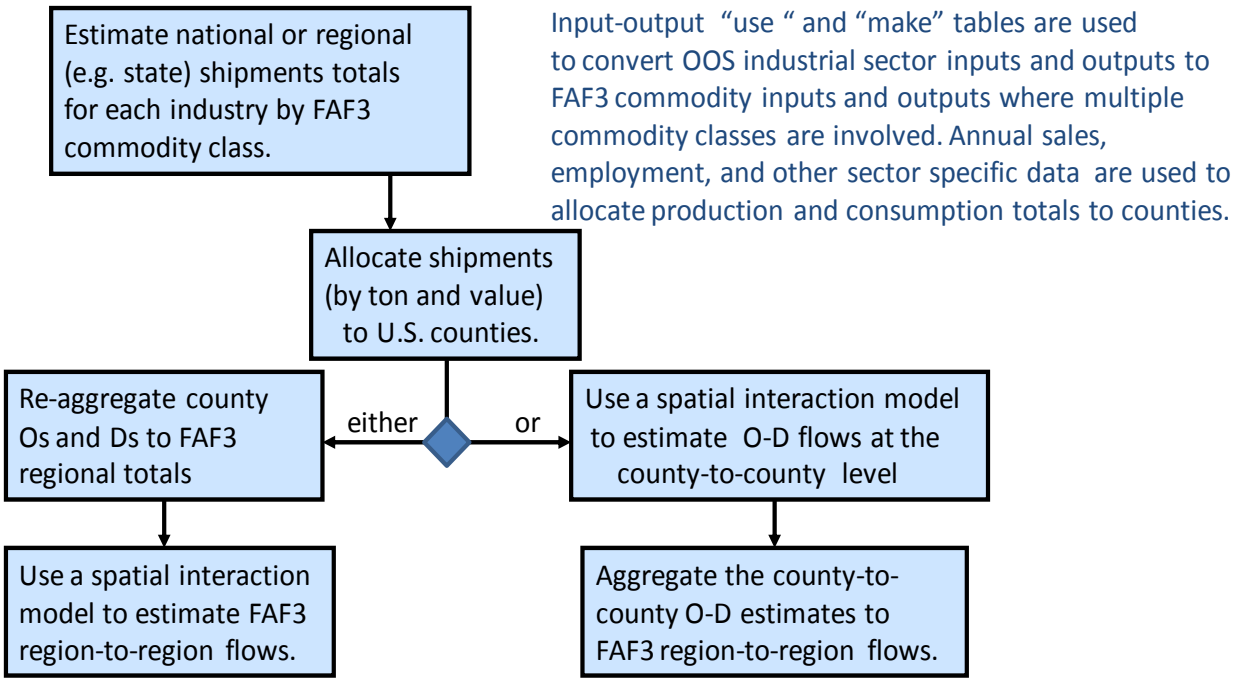

Figure 3.3 Four Step Process for Generating OOS Truck Freight Flows

The following sections focus on summarizing the datasets used to produce the FAF^3 flow estimates. For greater detail on estimation methods, the reader should consult FAF^3 industry sector-specific write-ups.

Farm Based Flows

Farm-based agricultural shipments represent one of the most significant out-of-scope areas for CFS. These shipments are almost entirely moved by truck. The vast majority of these shipments represent farm-to-storage elevator (e.g., grains) or farm-to-distribution/processing center (e.g., fruit, livestock) trips, at which point further transportation of these products is captured as part of the CFS sample frame. At the fully national level, the total tonnage of farm-based agricultural shipments constitutes nearly 7% of the 2007 total tonnage moved within the nation, and over 9% of all truck tons shipped. County and state level data published by in U.S. Department of Agriculture's (USDA) 2007 *Census of Agriculture* and the *2008 Agricultural Statistics* were used to generate FAF^3 tons and dollars shipped estimates, supplemented with data from several of USDA's *Statistical Bulletins*.

The dollar value of these farm originating agricultural products were estimated using information obtained from the *2007 Census of Agriculture* and related publications. Specifically, data provided under the category of "Market value of agricultural products sold"[10] was used as an estimate for total farm-based agricultural shipments. The estimation of tonnages for these out-of-scope shipments was less straightforward. Commodity statistics published in the USDA's *2007 Census of Agriculture* use a variety of commodity specific units of measurement (e.g., pounds, bushels, hundredweight, barrels, tons, etc). In some cases, different conversion factors, all based on information obtained from *Agriculture Statistics 2008,* were also needed for different commodities using the same basic unit of measurement. For example, the approximate net weight for a bushel of wheat is 60 pounds, while a bushel of husked corn on the ear weights 70 pounds, and shelled corn weighs in at 56 pounds per bushel on the average. Following these unit conversions, each farm-based agricultural commodity is then placed within its 2-digit SCTG commodity class.

Where a State is divided into more than one FAF^3 region, USDA county level data was used and subsequently re-aggregated to FAF^3 regional totals. This was done after filling gaps in this county-specific data, by using acreages devoted to a specific crop-growing activity as a surrogate for gaps in direct reporting of crop yields. O-D flows are then estimated, first by summing these county originations to their FAF^3 regional totals, then sharing these totals to FAF^3 destination regions on the basis of a) truck trip length distributions reported by the 2002 VIUS, and b) using the volumes of agricultural commodity originations reported by the 2007 CFS to allocate these flows. That is, these CFS originations (from the distribution centers, grain elevators, processing centers, etc. located within a CFS region) constitute the first non-farm stop in the agricultural product's supply chain. Hence they represent a good surrogate for the destinations of farm-based shipments. Separate allocations are made on the basis of tons shipped and dollar valued trades.

[10] The "market value of agricultural products sold" category represents the value of products sold which combines total sales not under production contract and total sales under production contract. It is equivalent to total sales. See Appendix B, General Explanation and Census of Agriculture Report Form, in the *2007 Census of Agriculture* report for further explanation (http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_1_US/usappxb.pdf)

As a result of this process, the annual tons and dollar valued flows between any two FAF[3] regions are consistent with both VIUS truck trip length distributions for a specific FAF[3] freight originating region and commodity class, and also create a consistency between OOS farm-based flows and the non-farm based agricultural commodity flows reported in the 2007 CFS.

Construction Industry Flows

Shipments originating from activities in the construction sector, including companies or establishments engaged in construction of residential and non-residential buildings, utility systems, roadways and bridges, and from specific trade contractors, are not in-scope for the CFS. It is estimated that this industry transported just under 1.08 billion tons of freight over the course of 2007, valued at $905.7 million. However, putting a dollar value on such freight is not straight-forward. The primary commodity shipped was debris (included in SCTG 41 under Waste and Scrap), for which the value would be relatively small unless recyclable materials are separated and sold. An estimate of the amount of debris generated by the construction industry was developed based on publications by the U.S. Environmental Protection Agency (EPA) publications,[11] the National Demolition Association, Construction Materials Recycling Association, and Gershman, Brickner & Bratton, Inc. Similar dollar to ton conversions for other commodity classes are drawn from the CFS or other industry specific sources.

Data on shipment distances for the industry are limited at best for 2007, and in FAF[3] all of these shipments are assumed to be short distance truck movements, most occurring within a single county, and all within the same FAF3 zone. Shipment volumes were assigned to FAF3 regions using sales data from the 2007 Economic Census (EC) where available, and using a combination of 2007 county level employment data from the Census Bureau's County Business Patterns (CBP) dataset, multiplied by Census developed labor productivity rates by industry class at the state level.

Fishery Flows

The CFS omits fishery shipments that move from vessels at the dock/port to the first point of processing or distribution centers. Establishments involved in this data gap are within the NAICS category 114 (fishing, hunting and trapping). Industries in this NAICS sector harvest fish and other wild animals from their natural habitats and are dependent upon a continued supply of the natural resource. Based on statistics published in the *Fisheries of the United States 2008*[12], an annual report prepared by the National Marine Fisheries Service (NMFS) of the National

[11] http://www.epa.gov/osw/conserve/rrr/imr/cdm/pubs/cd-meas.pdf.

[12] Information obtained from the *Fisheries of the United States 2008* report, published by National Marine fisheries Service, Office of Science and Technology in July 2009, was used to supplement its 2007 report under this analysis. Although 2007 statistics are available in the *Fisheries of the United States 2007*, many are in preliminary forms. The 2008 report provides more updated information on statistics for 2007.

Oceanic and Atmospheric Administration (NOAA), commercial landings by U.S. fishermen at ports in the 50 states were totaled at approximately 4.7 million tons and valued at over $4 billion in 2007. In addition, catches of Alaska Pollock, Pacific whiting, and other Pacific ground fish that are processed at-sea aboard U.S. vessels in the northeastern Pacific (off Washington, Oregon, and Alaska) are credited as landing to the state nearest to the area of capture. According to NMFS, these at-sea processed fishery products accounted for a total about 1.4 million tons and valued approximately $19 million in 2007. It is assumed that this freight activity is mostly local, and that all shipments involve intra-regional FAF^3 truck-only movements.[13]

Retail Industry Flows

The 2007 CFS also does not cover shipping activities originating from the vast majority of the nation's retail stores. It is estimated that 378.6 million tons of freight were shipped by the U.S. retail industry in 2007, valued at $624 billion. Based on the U.S. Bureau of Economic Analysis's National Input-Output Make and Use Tables, the retail industry generates commodity flows in most of the FAF^3 commodity classes.

Although most of the shipments from retail stores are within the same county, there is a possibility that retailers may transport large items purchased by customers from their warehouses, which may be located in other counties. At the county level this would be an issue, but is less likely to be of concern when aggregating O-D flows from counties up to FAF^3 regional totals. An issue with retail industry flows is whether some of these shipments are originated from retailer-owned warehouses that serve retail stores not covered by the CFS. In this case some inter-regional flows might be missing from FAF^3 totals. These volumes are believed to be quite small in percentage terms.

Service Industry Flows

This sector covers a wide range of services, including finance and insurance, real estate, rental and leasing, professional, scientific and technical services, administrative support, waste management and remediation services, education services, and health care and social assistance. These industries are typically involved in providing services to the general public, local business establishments, and branches of government, and in toto originate freight shipments in a large number of FAF^3 commodity classes. Also not covered by the 2007 CFS are the mail shipments by these service industries. The sector as a whole is estimated to have generated 378.6 million tons of commodity freight in 2007, worth just under an estimated $504.7 billion. To this is added some 11.4 million tons of mail, valued at $525.6 billion.

[13] Based on NMFS published statistics, total imported edible and non-edible fishery products were over 2.4 million tons and worth about $28.8 billion in 2007. Because imports are categorized as a separate out-of-scope area of the CFS (see Section 3.3.2 in this report), to avoid double counting, imported fishery is not included under this fishery shipment data gap study.

The availability of county level sales data varies by type of service offered. For example, the county level sales data for educational services are released for only 10 states. For real estate and food services, the sales data at the county level are available for 20 states. A first step was therefore to fill in this data gap for those service industries, then sum the sales of individual types of services to obtain an overall sales statistic for each county. Shipment volumes between counties were then estimated as follows (MacroSys, 2010):

- For non-mail shipments, the county level demand for service sector products (i.e. the market potentials for these destination counties) was determined by two factors: (i) the amount of a commodity used by industries according to the Use table in the U.S. I-O model and (ii) industrial employment at counties. Next, a spatial interaction ("gravity") model was used to distribute flows from each freight generating county to surrounding counties within our across FAF^3 regional boundaries.

- For mail shipments, total employment in services at the county level served as a surrogate for market potentials. Since mail is known to be shipped over long as well as short distances across the county, and lacking any empirical data on this distribution, no distance decay effect was applied to this sharing process in FAF^3.

Household and Business Move Flows

It is estimated that some 254.3 million tons of freight were moved by the industrial sector, nearly all of it by truck. The value of the goods moved is estimated at just $30.9 billion. Several sources of data on the volumes of U.S. household and business moves were examined, including the U.S. Census Bureau's Annual Services Survey and related studies conducted by the American Trucking Association and the American Moving and Storage Association.

All of these shipments are assumed to be truck moves in FAF^3. These truck shipments were allocated to counties on the basis of CBP-reported sector employment totals. The shipments are then allocated spatially between county O-D pairs based on IRS reported county level in-migration and out-migration totals. (In the absence of available data on trip length distributions, a distance decay effect was not used in this allocation process).

Logging Flows

Some 372.3 million tons of logs, totaling almost $9.5 billion by value, are estimated to have been transported in the U.S. as a whole in 2007, of which the vast majority are transported by truck from domestic forests to nearby sawmills and other local sites. County level logging products were estimated by multiplying the year 2007 employment in logging industries,, by an average tons per employee multiplier. To allow for logging products being transported across FAF^3 regional boundaries, these products were assigned to counties located within a 75 mile radius of the producing county, based on the employment in wood product industries within each county, and upon data collected on the average haul to market distance of logging products (e.g. sawlogs, peeler logs, OSB, pulpwood and rustic fencing).

Municipal Solid Waste Flows

Municipal solid waste (MSW) is not covered in the CFS, and also does not have a specific code in NAICS. The main data sources used for estimating 2007 MSW shipments came from information compiled by Franklin Associates[14] in collaboration with the U.S. EPA,[15] supplemented by information in the *BioCycle* journal[16]. Additional, mode specific data was also obtained from the U.S Army Corps of Engineers Waterborne Commerce statistics, and from the Surface Transportation Board's Railcar Waybills sample. As defined by the U.S. EPA, MSW includes the following 'Subtitle D wastes':

- Containers and packaging, such as soft drink bottles and cardboard boxes,
- Durable goods, such as furniture and appliances,
- Nondurable goods, such as newspapers, trash bags, and clothing, and
- Other wastes, such as food scraps and yard trimmings.

It is estimated that 413 million tons of MSW, as defined above, were transported within the U.S. in calendar year 2007. All of this MSW is collected at the source and transported to one of four types of processing facility: local landfills, local incineration facilities, local material recovery facilities, and waste transfer stations where garbage trucks unload MSW for accumulation and transfer to larger transport vehicles (truck, rail, or barge), for more economical long-distance hauling to a final disposal site (Curlee, 2009).

Data on the flows between states was based on work done by McCarthy (2007) for the Congressional Research Service. Combining this work with data from other sources, it is estimated that more than 42% of total state-to-state transfers (i.e. state exports) come from three states—New York, New Jersey, and Illinois, whole several other states export more than 10% of the U.S. total across state lines. The District of Columbia exports all of its total MSW generation, while New Jersey exports over 45%, New York exports over 33%, and Maryland over 29%. Additional states that export more than 10% of their MSW include Connecticut, Illinois, Kansas, Massachusetts, Missouri, North Carolina, Vermont, Washington, and West Virginia. More than 46% of all these state exports go to three states—Pennsylvania, Virginia, and Michigan Only five additional states account for more than 4% of the national total shipments of inter-state MSW—Georgia, Illinois, Indiana, New Jersey, Ohio, and Oregon. Based on ORNL discussions with local officials for the previous, FAF^2 effort, it appears that the large majority of shipments to adjoining states are essentially local shipments. For example, the city of Memphis ships MSW to Mississippi. Chicago ships tons to Indiana. The District of Columbia ships to Virginia. Also, small to medium sized towns near a state line may ship to an adjoining county across the state line. While these are truck movements, some longer distance shipments are by rail or (much less so) by inland waterway (i.e. by barge). It is estimated that just under 40% of inter-state

[14] http://www.fal.com/solid-waste-management.html
[15] http://www.epa.gov/epawaste/nonhaz/municipal/msw99.htm
[16] http://www.jgpress.com/biocycle.htm

shipments of MSW are by rail (mostly) or barge. This represents less than 4% of all MSW shipments.

The FAF3 MSW estimates also include significant tonnages moving from Maine to New Brunswick, Canada, from Ontario, Canada to Michigan, and a from Ontario to New York state (Curlee, 2009). Allocation of (truck-only) MSW between FAF^3 regions below the state level then used county populations to distribute inter-state flows, with subsequent re-aggregation from counties to FAF^3 regions. County-to-county O-D flows were estimated using a spatial interaction model, using an average O-D distance of just under 32 miles, derived from the MSW literature. These inter-county flows were then aggregated to their FAF^3 region-to-region totals.

Crude Petroleum

It is estimated that the US transported some 744.4 million tons of crude petroleum (crude oil) in 2007, using a variety of modes. This crude was valued at some $336.4 trillion dollars. These crude oil shipments begin either at domestic oil fields, or from large marine terminals that act as the first domestic storage and transfer point for foreign oil imports. The crude is delivered either to refineries or to long-term storage facilities such as the Strategic Petroleum Reserve.. A great deal of this transport is accomplished by pipeline, and by marine vessels (inland barge and oceangoing tanker), with significant tonnages also moved by rail tanker car and locally by tank truck.

National level crude oil shipment information by transportation mode is based on *Shifts in Petroleum Transportation* published annually by the Association of Oil Pipelines. This report's modal information is in turn based on several other data sources, including:

- Oil Pipelines: Annual Report of oil pipeline companies provided to the Federal Energy Regulatory Commission (FERC Form 6);
- Water Carriers: Waterborne Commerce of the United States, U.S. Army Corps of Engineers, (Part 5, Table 2-2);
- Motor Carriers: Petroleum Tank Truck Carriers Annual Report, American Trucking Association, Inc. and Petroleum Supply Annual, Energy Information Administration (EIA) (Volume 1, Table 46); and
- Railroads: Carload Waybill Statistics, Report TD-1, USDOT, Federal Railroad Administration, and Freight Commodity Statistics, Association of American Railroads (Table A3).

O-D flows of crude petroleum were derived using US DOE/EIA supplied data at various levels of geographic detail, ranging from five broad multi-state PADDs (Petroleum Administration for

Defense Districts)[17] and individual States, to specific refinery locations. This includes data from EIA's Petroleum Supply Annual (EIA, 2010) on:

- Production of Crude oil by PAD District and State,
- Refinery Input of Crude Oil by Refining Districts, and
- Refinery Receipts of Crude Oil by Method of Transportation, by PADD.

Spatial interaction (e.g. "gravity") models were then used to disaggregate flows down to a State-to-State and FAF region-to-FAF region level. First, U.S. Census' County Business Pattern data for 2007 was used to share total crude production by state down to the county level. This allocation was based on a county's reported total annual payroll for industries classified under NAICS code 211111 – 'Crude Petroleum and Natural Gas Extraction'.[18] These county activity totals were then aggregated to their respective FAF^3 regions. This resulted in 80 different petroleum sourcing regions, serving 50 petroleum refining FAF^3 regions. O-to-D allocations between these pairs of regions were then estimated using a distance-decay based spatial interaction model, applied at this broader regional level of resolution.

Natural Gas Products

Delivering natural gas (principally methane, but also smaller volumes of ethane, propane, butane and pentane) is an enormous enterprise. This gas is transported to consumers through more than 300,000 miles of transmission pipelines with the help of vast storage reservoirs and thousands of compressors. This gas is sold to marketers, large commercial and industrial consumers, and distribution companies for delivery to consumers over a network of more than 1.1 million miles of local distribution pipelines.

National Natural Gas flow totals, and O-D region-to-region flows were derived from the EIAs' Natural Gas Annual (EIA, 2010)[19], making use of data at various levels of geographic detail, including:

- Gross Withdrawals and Marketed Production of Natural Gas by State and the Gulf of Mexico,
- Offshore Gross Withdrawals of Natural Gas by State and the Gulf of Mexico,
- Summary of U.S. Natural Gas Imports By Point of Entry, and
- Summary of U.S. Natural Gas Exports By Point of Exit, Natural Gas Annual.

Spatial interaction models were then used, where necessary, to disaggregate flows down to a

[17] The New England, Midwest, East Coast, Gulf Coast, and West Coast PADDs. For specific state allocations to APDDs see: http://www.eia.gov/glossary/index.cfm?id=P#PADD_def

[18] The data is obtained by county level from the County Business Pattern at the U.S. Census Bureau - http://www.census.gov/econ/cbp/intro.htm.

[19] See http://tonto.eia.doe.gov/dnav/ng/ng_pub_publist.asp

State-to-State and a FAF region-to-FAF region level.

3.3.2 Import and Export Flows

Imported as well as exported freight flows in FAF^3 are constructed from a variety of data sources, each of which must have its flows converted from agency specific commodity codes to FAF^3's 2-digit SCTG codes, as well as have its flows either spatially aggregated or disaggregated to match FAF^3 analysis zones. Figure 3.4 provides a top-down view of this process.[20] The following sections describe each source data-specific procedure in more detail.

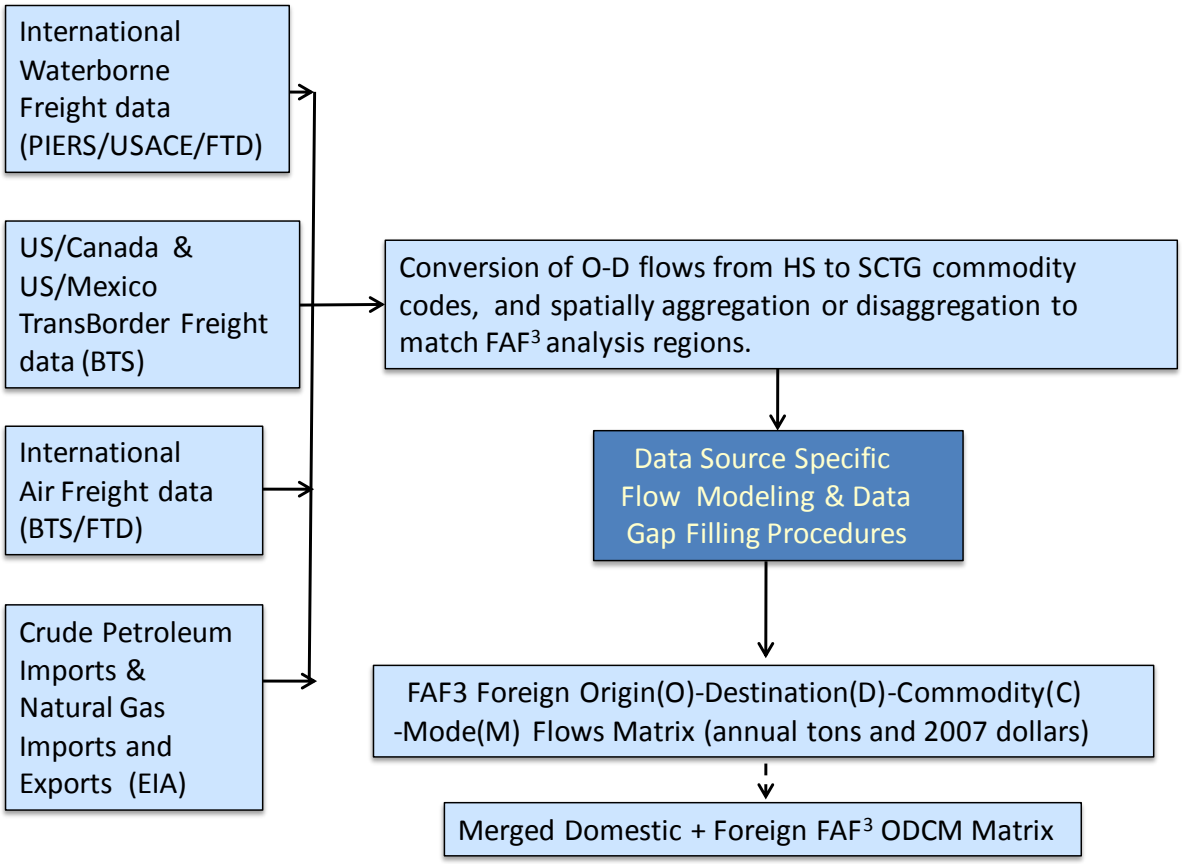

Figure 3.4 FAF3 International (Import/Export) Data Modeling

Waterborne Imports and Exports are derived in FAF^3 using four different data sets, each of which provides a different look at the nation's international freight movements by ocean vessels:

[20] Although the 2007 CFS does also collect data on export shipments by US establishments, both coverage and statistical accuracy is limited by sample size issues and this data was not used as a source for FAF3 export flow estimates.

- The U.S. Army Corps of Engineers International Waterborne Commerce Database[21]
- The U.S. Census Bureau's Foreign Trade Database[22]
- A FAF^3-specific extraction of data from the PIERS Import/Export Database[23]
- Imported & Exported Petroleum & Natural Gas data from the U.S. Department of Energy's Energy Information Agency (EIA)

The availability of these last two data sources represents a significant enhancement in FAF^3, and especially the PIERS dataset, which provided estimates of the internal to the U.S distribution of imported and exported goods. In 2002, the distribution of domestic CFS shipments was used to impute domestic trip ends and modes used in FAF^2 for every commodity that passed through a seaport. In 2007, information from PIERS was used to impute many of these domestic trip ends, with 2007 CFS data being used to impute the modes used between U.S. seaports and their internal U.S. destinations or origins.

International Air Freight Flows: Data published by the U.S. DOT's Office of Airline Information (OAI), Bureau of Transportation Statistics provided the FAF^3 estimates of total tons shipped annually between originating airports (where the cargo is first loaded onto an aircraft) and destination airports (where the cargo is unloaded for final land-based delivery, usually by truck).[24] This data is combined with data collected by U.S. Customs on the commodity class and value of international air shipments, as reported by the Foreign Trade Division (FTD) of the U.S. Department of Commerce's Bureau of the Census.[25] This FTD dataset includes information on the value,[26] quantity, method of transportation, and shipping weights for 9,000 export commodities, 17,000 imported commodities, 240 trading partners, and 45 U.S. Customs Districts.

The OAI and FTD data are combined into a single FAF^3 air freight dataset by reconciling differences in the level of spatial and commodity detail to match those required by the FAF. First each airport was assigned to its U.S. county, and each county to both its appropriate U.S. Customs District and FAF3 region, using geographic coordinates data files available from OAI and the Census Bureau. Commodities are reported in the FTD dataset using the 10-digit Harmonized Tariff Schedule (HS Schedule B for exports). This data is aggregated and translated to FAF3's 43 2-digit SCTG commodity classes using a crosswalk specifically developed for the purpose. Where differences exist between the OAI and FTD flow totals, the OAI database was taken to be definitive for total tons shipped, and the FTD database was used to control the

[21] http://www.iwr.usace.army.mil/ndc/data/dataimex.htm
[22] http://www.census.gov/foreign-trade/reference/products/index.html
[23] Special tabulations prepared for the FAF3 project by PIERS staff. (http://www.piers.com/)
[24] T-100 (foreign) market data. http://www.bts.gov/publications/freight_transportation/
[25] http://www.census.gov/foreign-trade/reference/products/index.html
[26] Export values are reported free-alongside-ship (F.A.S.) Import values are reported as customs-insurance-freight (C.I.F) values.

allocation of freight shipments to commodity classes, and to assign value-to-weight ratios to these flows.

U.S.-Canada and U.S.-Mexico Transborder Freight Flows: Truck and rail freight movements between the United States and its NAFTA neighbors Canada and Mexico are derived in FAF[3] from the Bureau of Transportation Statistics (BTS) Transborder Freight Database, itself constructed from data collected at border crossings by the U.S. Customs Service. After converting the Harmonized Tariff Schedule (HS) commodity classes in this dataset to FAF[3] SCTG classes, County Business Patterns are used to allocate flows reported at the State level to their most likely FAF3 regions within the United States.

Imports and Exports of Natural Gas and Imports of Crude Petroleum: Liquefied Natural Gas (LNG) is imported or exported to/from the U.S. by large tanker ships. The US Department of Energy's Energy Information Administration (EIA) reports annual LNG imports/exports in millions of cubic feet by U.S. seaport of entry/exit. The EIA also reports the annual trade in pipeline supplied natural gas (NG) between the U.S. and Canada and the U.S. and Mexico, also in millions of cubic feet. Reporting here is both by State and by specific U.S. seaport of entry/exit, requiring assignment of flows to seaport-inclusive FAF[3] regions.[27]

EIA databases were also used to estimate crude petroleum imports in FAF[3], taking advantage of the fact that crude petroleum imports are reported to the EIA monthly at the company, U.S. seaport of entry/exit, and foreign country level[28], allowing the complete movement of imported crude oil from the foreign country (source of commodity), passing through the port (domestic origin), to the refinery (domestic destination) to be estimated. The allocation of these flows to specific modes of transportation was then based on EIA data on crude oil refinery receipts, broken down by mode of transportation (ship, pipeline, rail, barge, truck), and further broken down by domestic versus foreign sources of production.[29]

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[27] Both the EIA's LNG and NG data sources for US Imports/exports can be found at: http://tonto.eia.doe.gov/oil_gas/natural_gas/info_glance/natural_gas.html

[28] *http://www.eia.doe.gov/oil_gas/petroleum/data_publications/company_level_imports/cli.html*

[29] *http://www.eia.doe.gov/oil_gas/petroleum/data_publications/refinery_capacity_data/refcapacity.html*

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Appendix A: Differences in the FAF^3 and FAF^2 Freight Flow Matrices

The FAF^3 ***Analysis Zones*** are different from the FAF^2 zones. Since the FAF freight flow matrix is developed around the data supplied by the U.S Commodity Flow Surveys (CFS) the geography has changed with CFS geography. In 2007 the use of more CFS analysis zones (made possible by the much larger size of the CFS sample) allows the FAF to adopt these CFS zones while maintaining its focus on U.S. coastal analysis zones that both receive and pass on most U.S. imports and exports. This compatibility with the CFS geography should make future development of FAF flow estimates not only less time consuming but also prone to one fewer sources of possible estimation bias.

The FAF^3 ***Mode Classes*** have also changed since 2002. Table A1 below shows the differences. Note that, due to the redefinition and changed reporting of intermodal/multimodal categories between the 2002 and 2007 CFS on which the FAF is based, there is no direct equivalence in the modal classes implied between these two sets of definitions,. Differences in the way the 2007 versus the 2002 CFS assigned water-only versus water-inclusive intermodal shipments (typically, truck-water combinations) also means that direct comparisons of water only traffic volumes and modal shares is problematic.

Table A1. Modal Class Changes 2002 – 2007

FAF2 Modes (2002)	FAF3 Modes (2007)
Truck	Truck
Rail	Rail
Water	Water
Air, air and truck	Air,air and truck
Truck and rail	Multiple modes and Mail
Other intermodal[1]	Pipeline
Pipeline and Unknown	Other and Unknown

FAF^2 "Other intermodal" includes U.S. Postal Service and courier shipments and all intermodal combinations except air and truck.

FAF^3 Modal definitions are given below:

Table A2. FAF^3 Modal Definitions

Mode Identification	Mode Name	Mode Description
1	Truck	Includes private and for-hire truck. Private trucks are owned or operated by shippers, and exclude personal use vehicles hauling over-the-counter purchases from retail establishments.
2	Rail	Any common carrier or private railroad.
3	Water	Includes shallow draft, deep draft and Great Lakes shipments.
4	Air (includes truck-air)	Includes shipments typically weighing more than 100 pounds that move by air or a combination of truck and air in commercial or private aircraft. Includes air freight and air express. Shipments typically weighing 100 pounds or less are classified with *Multiple Modes and Mail*
5	Multiple Modes and Mail	Includes shipments by multiple modes and by parcel delivery services, U.S. Postal Service, or couriers. This category is not limited to containerized or trailer-on-flatcar shipments.
6	Pipeline	Includes flows from offshore wells to land, which are counted as water moves by the U.S. Army Corps of Engineers.
7	Other and Unknown	Includes flyaway aircraft, vessels, and vehicles moving under their own power from the manufacturer to a customer and not carrying any freight, unknown, and miscellaneous other modes of transport.
8	No Domestic Mode	A 'No Domestic Mode' category is used to capture petroleum imports that go directly from foreign, inbound ships to an on-shore US refinery. This is done to ensure a proper accounting when foreign and domestic flows are summed, while avoiding assigning flows to the domestic transportation network that do not use it.

FAF^2 modal definitions are as follows:

1 – 4. Truck, Rail, Water and Air (including truck-air) definitions are the same as those used in FAF^3.

5. Truck-Rail Intermodal—Shipments that use a combination of truck and rail.

6. Other Multiple Modes—Includes Parcel (U.S. Postal Service or Courier), truck-water, and water-rail.

7. Other and Unknown Modes—Includes Pipeline and any mode not listed above.

The FAF3 Commodity Classes, like those in FAF^2, mirror the 43, 2-digit (i.e. most aggregate) SCTG classes reported by the 2007 CFS. Differences in the composition of these classes between 2002 and 2007 are relatively minor, with two exceptions:

- Printed product flows, which were absent from the 2002 CFS and hence modeled as OOS flows in FAF^2 were covered in the 2007 CFS.
- A second change for FAF^3 was the O-D specific treatment of natural gas products, which were evaluated only at the level of national or broad regional activity totals in FAF^2.

APPENDIX H: SERVICE CARGO VOLUMES AND HANDLING COSTS

Service Option 1

Service Option 1
Port Rotation: New Bedford – Portland – Del River – Baltimore – New Bedford

Southbound Volumes: Load Port	FAF Origin	FAF Dest	Disch Port	Tons p.a. 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	$/Unit Origin Loading	$/Unit Destination Discharge	Handling Cost/ Week
Portland	Maine	Phil NI	Del River	460	25%	20	5,750	111	205	230	48,111
Portland	Maine	Phil	Del River	306	25%	20	3,825	74	205	230	32,016
Portland	Maine	MD Rem	Baltimore	13	25%	20	163	3	205	295	1,550
Portland	Maine	Balt	Baltimore	62	25%	20	775	15	205	295	7,450
New Bedford	Boston	Phil NI	Del River	-	25%	20	-	-	205	230	-
New Bedford	Boston	Phil	Del River	-	25%	20	-	-	205	230	-
New Bedford	Boston	MD Rem	Baltimore	69	25%	20	863	17	205	295	8,300
New Bedford	Boston	Balt	Baltimore	88	25%	20	1,100	21	205	295	10,600
New Bedford	MA Rem/RI/CTRem	Phil NI	Del River	-	25%	20	-	-	205	230	-
New Bedford	MA Rem/RI/CTRem	Phil	Del River	-	25%	20	-	-	205	230	-
New Bedford	MA Rem/RI/CTRem	MD Rem	Baltimore	36	25%	20	450	9	205	295	4,350
New Bedford	MA Rem/RI/CTRem	Balt	Baltimore	43	25%	20	538	10	205	295	5,150
Southbound Total				1,077			13,463	259			117,527
Del River	Phil NI	Maine	Portland	76	25%	20	950	18	230	205	7,961
Del River	Phil NI	Boston	New Bedford	-	25%	20	-	-	230	205	-
Del River	Phil NI	MA Rem/RI/CTRem	New Bedford	-	25%	20	-	-	230	205	-
Del River	Phil	Maine	Portland	127	25%	20	1,588	31	230	205	13,268
Del River	Phil	Boston	New Bedford	-	25%	20	-	-	230	205	-
Del River	Phil	MA Rem/RI/CTRem	New Bedford	-	25%	20	-	-	230	205	-
Baltimore	MD Rem	Maine	Portland	9	25%	20	113	2	295	205	1,100
Baltimore	MD Rem	Boston	New Bedford	79	25%	20	988	19	295	205	9,500
Baltimore	MD Rem	MA Rem/RI/CTRem	New Bedford	89	25%	20	1,113	21	295	205	10,700
Baltimore	Balt	Maine	Portland	314	25%	20	3,925	76	295	205	37,750
Baltimore	Balt	Boston	New Bedford	348	25%	20	4,350	84	295	205	41,850
Baltimore	Balt	MA Rem/RI/CTRem	New Bedford	113	25%	20	1,413	27	295	205	13,600
Northbound Total				1,155		240	14,438	278			135,728
Grand Total Loads							**27,900**	**537**			

	Cost Col
ILA Costs	12
Reduced Costs	19
Use:	**12**

Flow ImBalances By Port	Disch	Load	Balance	
Portland	127	202	-76	145
New Bedford	151	57	95	145
Del River	184	49	135	150
Baltimore	75	229	-154	215
Total	537	537	0	

Grand Total	**Loads Carried:**	**537**	**Handling Cost/Week** **253,255**
Service Recap			**Handling Cost Per Load** **$ 472**

Voy Option	Ship Type	Cap - Units Per Voy	Voy Days	Vsl Voy Costs	Vsl Own/Op	Fuel Costs	Port Calls	Avg Speed
a) 4.0 day	vsl03	255	4.0	519	258.5	196.8	63.4	21.7
b) 5.0 day	vsl04	314	5.0	492	286.6	139.7	65.3	15.2
c) 5.0 day	vsl01	151	5.0	408	236.2	111.4	60.3	15.2
d) 5.0 day	vsl11	426	5.0	399	178.6	150.7	69.4	13.2

Service Option 1a

Service Option 1a
Port Rotation: Boston – Portland – Del River – Baltimore – Boston **1 Voy/wk**

Southbound Volumes: Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
Portland	Maine	Phil NJ	Del River	460	25%	20	5,750	111	111	205	230	48,111
Portland	Maine	Phil	Del River	306	25%	20	3,825	74	74	205	230	32,016
Portland	Maine	MD Rem	Baltimore	13	25%	20	163	3	3	205	295	1,550
Portland	Maine	Balt	Baltimore	62	25%	20	775	15	15	205	295	7,450
Boston	Boston	Phil NJ	Del River	0	25%	20	-	0	0	295	230	-
Boston	Boston	Phil	Del River	0	25%	20	-	0	0	295	230	-
Boston	Boston	MD Rem	Baltimore	69	25%	20	863	17	17	295	295	9,794
Boston	Boston	Balt	Baltimore	88	25%	20	1,100	21	21	295	295	12,508
Boston	MA Rem	Phil NJ	Del River	0	25%	20	-	0	0	295	230	-
Boston	MA Rem	Phil	Del River	0	25%	20	-	0	0	295	230	-
Boston	MA Rem	MD Rem	Baltimore	6	25%	20	75	1	1	295	295	826
Boston	MA Rem	Balt	Baltimore	19	25%	20	238	5	5	295	295	2,714
Southbound Total				1023			12,788	246	246			114,969
Del River	Phil NJ	Maine	Portland	76	25%	20	950	18	18	230	205	7,961
Del River	Phil NJ	Boston	Boston	0	25%	20	-	0	0	230	295	-
Del River	Phil NJ	MA Rem	Boston	0	25%	20	-	0	0	230	295	-
												-
Del River	Phil	Maine	Portland	127	25%	20	1,588	31	31	230	205	13,268
Del River	Phil	Boston	Boston	0	25%	20	-	0	0	230	295	-
Del River	Phil	MA Rem	Boston	0	25%	20	-	0	0	230	295	-
												-
Baltimore	MD Rem	Maine	Portland	9	25%	20	113	2	2	295	205	1,100
Baltimore	MD Rem	Boston	Boston	79	25%	20	988	19	19	295	295	11,210
Baltimore	MD Rem	MA Rem	Boston	78	25%	20	975	19	19	295	295	11,092
												-
Baltimore	Balt	Maine	Portland	314	25%	20	3,925	76	76	295	205	37,750
Baltimore	Balt	Boston	Boston	348	25%	20	4,350	84	84	295	295	49,383
Baltimore	Balt	MA Rem	Boston	65	25%	20	813	16	16	295	295	9,204
Northbound Total				1096		240	13700	264	264			140967

Flow Im-Balances	Disch	Load	Balance		
Portland	127	202	-76	145	
Boston	137	44	93	215	
Del River	184	49	135	150	
Baltimore	62	215	-153	215	
Total	510	510	0		-

Grand Total	**Loads Carried:**	**510**	**Handling Costs** **255,936**
			Handling Cost Per Load **$ 502**

Service Recap Voy Option	Cap - Units Per Voy	Voy Days	Vsl Voy Costs	Vsl Own/Op	Fuel Costs	Port Calls	Avg Speed
a) 5.0 day, vsl 04	314	5.0	503	289.0	142.9	71.2	15.0
b) 4.0 day, vsl 03	255	4.0	516	255.9	184.1	75.6	20.6
c) 5.0 day, vsl 01	151	5.0	423	238.2	113.6	71.2	15.0

Service Option 1b

Service Option 1b
Port Rotation: Boston – Portland – Del River – Baltimore – Boston **1 Voy/wk**

Southbound Volumes:				Tons						$/Unit	$/Unit	Handling Cost/
Load Port	FAF Origin	FAF Dest	Disch Port	000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	Loading	Discharge	Voyage
Portland	Maine	Phil NJ	Del River	460	25%	20	5,750	110.6	110.6	205	230	48,111
Portland	Maine	Phil	Del River	306	25%	20	3,825	73.6	73.6	205	230	32,016
Portland	Maine	Norfolk	Norfolk	6	25%	20	75	1.4	1.4	205	295	700
Portland	Maine	Richmond	Norfolk	59	25%	20	738	14.2	14.2	205	295	7,100
Boston	Boston	Phil NJ	Del River	0	25%	20	-	0	0.0	295	230	-
Boston	Boston	Phil	Del River	0	25%	20	-	0	0.0	295	230	-
Boston	Boston	Norfolk	Norfolk	15	25%	20	188	3.6	3.6	295	295	2,124
Boston	Boston	Richmond	Norfolk	68	25%	20	850	16.3	16.3	295	295	9,617
Boston	MA Rem	Phil NJ	Del River	0	25%	20	-	0	0.0	295	230	-
Boston	MA Rem	Phil	Del River	0	25%	20	-	0	0.0	295	230	-
Boston	MA Rem	Norfolk	Norfolk	7	25%	20	88	1.7	1.7	295	295	1,003
Boston	MA Rem	Richmond	Norfolk	15	25%	20	188	3.6	3.6	295	295	2,124
Southbound Total				936			11,700	225	225.0			102,795
Del River	Phil NJ	Maine	Portland	76	25%	20	950	18.3	18.3	230	205	7,961
Del River	Phil NJ	Boston	Boston	0	25%	20	-	0	0.0	230	295	-
Del River	Phil NJ	MA Rem	Boston	0	25%	20	-	0	0.0	230	295	-
												-
Del River	Phil	Maine	Portland	127	25%	20	1,588	30.5	30.5	230	205	13,268
Del River	Phil	Boston	Boston	0	25%	20	-	0	0.0	230	295	-
Del River	Phil	MA Rem	Boston	0	25%	20	-	0	0.0	230	295	-
												-
Norfolk	Norfolk	Maine	Portland	6	25%	20	75	1.4	1.4	295	205	700
Norfolk	Norfolk	Boston	Boston	30	25%	20	375	7.2	7.2	295	295	4,248
Norfolk	Norfolk	MA Rem	Boston	19	25%	20	238	4.6	4.6	295	295	2,714
												-
Norfolk	Richmond	Maine	Portland	11	25%	20	138	2.6	2.6	295	205	1,300
Norfolk	Richmond	Boston	Boston	155	25%	20	1,938	37.3	37.3	295	295	22,007
Norfolk	Richmond	MA Rem	Boston	6	25%	20	75	1.4	1.4	295	295	826
Northbound Total				430		240	5375	103	103.3			53,023

Flow Im-Balances	Disch	Load	Balance		
Portland	53	200	-147	145	
Boston	51	25	25	215	
Del River	184	49	135	145	
Norfolk	41	55	-14	215	
Total	328	328	0		-

Grand Total	**Loads Carried:**	**328**	**Handling Costs**	**155,818**
			Handling Cost Per Load	**$ 475**

Service Recap	Cap - Units	Voy	Vsl Voy	Vsl	Fuel	Port	Avg
Voy Option	Per Voy	Days	Costs	Own/Op	Costs	Calls	Speed
a) 5.0 day, vsl 04, Ches	314	5.0	542	289.0	185.2	67.4	18.0
b) 5.0 day, vsl 01	151	5.0	449	238.2	142.9	67.4	17.0

Service Option 2

Service Option 2
Port Rotation: NYNJ – Miami – Port Canaveral – NYNJ — **1 Voy/wk**

Relevant Port-Pair Volumes — **Shaded lanes are a particular geographic "stretch"**
Assumed Frequency

Southbound Volumes: Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost $000s/ Voyage
NYNJ	NYNY	Miami	Miami	494	25%	20	6,175	118.8	118.8	300	190	58,212
NYNJ	NYNY	Orlando	Canaveral	184	25%	20	2,300	44.2	44.2	300	190	21,658
NYNJ	NYNY	Tampa	Canaveral	281	25%	20	3,513	67.5	67.5	300	190	33,075
NYNJ	NYNY	Jacksonville	Canaveral	46		20	-	0	0.0	300	190	-
NYNJ	NYNJ	Miami	Miami	277	25%	20	3,463	66.6	66.6	300	190	32,634
NYNJ	NYNJ	Orlando	Canaveral	94	25%	20	1,175	22.6	22.6	300	190	11,074
NYNJ	NYNJ	Tampa	Canaveral	86	25%	20	1,075	20.7	20.7	300	190	10,143
NYNJ	NYNJ	Jacksonville	Canaveral	48		20	-	0	0.0	300	190	-
NYNJ	Phil NJ	Miami	Miami	222	0%	20	-	0	0.0	300	190	-
NYNJ	Phil NJ	Orlando	Canaveral	22	0%	20	-	0	0.0	300	190	-
NYNJ	Phil NJ	Tampa	Canaveral	27	0%	20	-	0	0.0	300	190	-
NYNJ	Phil NJ	Jacksonville	Canaveral	6	0%	20	-	0	0.0	300	190	-
Southbound Total				1787			17,700	340	340		490	166,796
Canaveral	Jacksonville	NYNJ	NYNJ	23		20	-	0	0.0	190	300	-
Canaveral	Orlando	NYNJ	NYNJ	38	25%	20	475	9.1	9.1	190	300	4,459
Canaveral	Tampa	NYNJ	NYNJ	53	25%	20	663	12.7	12.7	190	300	6,223
Miami	Miami	NYNJ	NYNJ	62	25%	20	775	14.9	14.9	190	300	7,301
Canaveral	Jacksonville	NYNY	NYNJ	16		20	-	0	0.0	190	300	-
Canaveral	Orlando	NYNY	NYNJ	73	25%	20	913	17.5	17.5	190	300	8,575
Canaveral	Tampa	NYNY	NYNJ	186	25%	20	2,325	44.7	44.7	190	300	21,903
Miami	Miami	NYNY	NYNJ	140	25%	20	1,750	33.7	33.7	190	300	16,513
Canaveral	Jacksonville	Phil NJ	NYNJ	2	0%	20	-	0	0.0	190	300	-
Canaveral	Orlando	Phil NJ	NYNJ	2	0%	20	-	0	0.0	190	300	-
Canaveral	Tampa	Phil NJ	NYNJ	2	0%	20	-	0	0.0	190	300	-
Miami	Miami	Phil NJ	NYNJ	7	0%	20	-	0	0.0	190	300	-
Northbound Total				604			6900	133	133		490	64,974

Flow Im-Balances	Disch	Load	Balance	
NYNJ	133	340	-208	170
Miami	185	49	137	140
Canaveral	155	84	71	140
Total	473	473	0	

Grand Total — **Loads Carried: 473** — **Handling Costs 231,770**
Handling Cost Per Load $ 490

Service Recap Voy Option	Cap - Units Per Voy	Voy Days	Vsl Voy Costs	Vsl Own/Op	Fuel Costs	Port Calls	Avg Speed
a) 7day, vsl 04	314	7.0	748	404.6	273.4	69.7	16.6
b) 7day, vsl 01	151	7.0	620	333.5	216.7	69.7	16.6

Service Option 3

Service Option 3
Port Rotation: Del River – Miami – Port Canaveral – Del River — **1 Voy/wk**

Relevant Port-Pair Volumes
Assumed Frequency — **Shaded lanes are a particular geographic "stretch"**

Southbound Volumes: Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost $000s/ Voyage
Del River	Phil NJ	Miami	Miami	222	25%	20	2,775	53.4	53.4	230	190	22,428
Del River	Phil NJ	Orlando	Canaveral	22	25%	20	275	5.3	5.3	230	190	2,226
Del River	Phil NJ	Tampa	Canaveral	27	25%	20	338	6.5	6.5	230	190	2,730
Del River	Phil NJ	Jacksonville	Canaveral	6		20	-	0	0.0	230	190	-
Del River	Phil	Miami	Miami	186	25%	20	2,325	44.7	44.7	230	190	18,774
Del River	Phil	Orlando	Canaveral	73	25%	20	913	17.5	17.5	230	190	7,350
Del River	Phil	Tampa	Canaveral	28	25%	20	350	6.7	6.7	230	190	2,814
Del River	Phil	Jacksonville	Canaveral	21		20	-	0	0.0	230	190	-
Del River	NYNJ	Miami	Miami	277	0%	20	-	0	0.0	230	190	-
Del River	NYNJ	Orlando	Canaveral	94	0%	20	-	0	0.0	230	190	-
Del River	NYNJ	Tampa	Canaveral	86	0%	20	-	0	0.0	230	190	-
Del River	NYNJ	Jacksonville	Canaveral	48	0%	20	-	0	0.0	230	190	-
Southbound Total				1090			6,975	134	134			56,322
Canaveral	Jacksonville	Phil NJ	Del River	2		20	-	0	0.0	190	230	-
Canaveral	Orlando	Phil NJ	Del River	2	25%	20	25	0.5	0.5	190	230	210
Canaveral	Tampa	Phil NJ	Del River	2	25%	20	25	0.5	0.5	190	230	210
Miami	Miami	Phil NJ	Del River	7	25%	20	88	1.7	1.7	190	230	714
Canaveral	Jacksonville	Phil	Del River	18		20	-	0	0.0	190	230	-
Canaveral	Orlando	Phil	Del River	9	25%	20	113	2.2	2.2	190	230	924
Canaveral	Tampa	Phil	Del River	47	25%	20	588	11.3	11.3	190	230	4,746
Miami	Miami	Phil	Del River	263	25%	20	3,288	63.2	63.2	190	230	26,544
Canaveral	Jacksonville	NYNJ	Del River	23	0%	20	-	0	0.0	190	230	-
Canaveral	Orlando	NYNJ	Del River	38	0%	20	-	0	0.0	190	230	-
Canaveral	Tampa	NYNJ	Del River	53	0%	20	-	0	0.0	190	230	-
Miami	Miami	NYNJ	Del River	62	0%	20	-	0	0.0	190	230	-
Northbound Total				526		240	4125	79	79			33,348

Flow Im-Balances	Disch	Load	Balance	
Del River	79	134	-55	150
Miami	98	65	33	140
Canaveral	36	15	22	140
Total	214	214	0	

Grand Total — **Loads Carried: 214** — **Handling Costs 89,670**
Handling Cost Per Load $ 420

Service Recap Voy Option	Cap - Units Per Voy	Voy Days	Vsl Voy Costs	Vsl Own/Op	Fuel Costs	Port Calls	Avg Speed
a) 7day, vsl 04	314	7.0	724	404.6	251.6	67.5	16.2
a) 7day, vsl 01	151	7.0	594	333.5	199.7	60.9	16.2

Service Option 4

Service Option 4 – Coastal Pendulum (Balt)

Port Rotation: Nw Bed – Portlnd – Del Riv – Balt – Wilm – Balt – Del Riv – Nw Bed **1 Voy/wk** (same as 6, but no CHS call)

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
Southbound Volumes:												
Portland	Maine	Phil NJ	Del River	460	25%	20	5,750	110.6	110.6	205	230	48,111
Portland	Maine	Phil	Del River	306	25%	20	3,825	73.6	73.6	205	230	32,016
Portland	Maine	Baltimore	Baltimore	62	25%	20	775	14.9	14.9	205	295	7,450
Portland	Maine	MD Rem	Baltimore	13	25%	20	163	3.1	3.1	205	295	1,550
New Bedford	Boston	Phil NI	Del River	-	25%	20	-	0	0.0	205	230	-
New Bedford	Boston	Phil	Del River	-	25%	20	-	0	0.0	205	230	-
New Bedford	Boston	MD Rem	Baltimore	69	25%	20	863	16.6	16.6	205	295	8,300
New Bedford	Boston	Balt	Baltimore	88	25%	20	1,100	21.2	21.2	205	295	10,600
New Bedford	MA Rem/RI/CTRem	Phil NI	Del River	-	25%	20	-	0	0.0	205	230	-
New Bedford	MA Rem/RI/CTRem	Phil	Del River	-	25%	20	-	0	0.0	205	230	-
New Bedford	MA Rem/RI/CTRem	MD Rem	Baltimore	36	25%	20	450	8.7	8.7	205	295	4,350
New Bedford	MA Rem/RI/CTRem	Balt	Baltimore	43	25%	20	538	10.3	10.3	205	295	5,150
			Subtotal	**1077**			**13,463**	**259**	**259**			**117,527**
Del River	Phil NJ	NC Rem	Wilm	123	25%	20	1,538	29.6	29.6	230	220	13,320
Del River	Phil NJ	SC Rem	CHS	23		20	-	0	0.0	230	220	-
Del River	Phil NJ	CHS	CHS	3		20	-	0	0.0	230	220	-
Del River	Phil	NC Rem	Wilm	1429	25%	20	17,863	343.5	343.5	230	220	154,575
Del River	Phil	SC Rem	CHS	95		20	-	0	0.0	230	220	-
Del River	Phil	CHS	CHS	9		20	-	0	0.0	230	220	-
Baltimore	Baltimore	NC Rem	Wilm	0	25%	20	-	0	0.0	295	220	-
Baltimore	Baltimore	SC Rem	CHS	295		20	-	0	0.0	295	220	-
Baltimore	Baltimore	CHS	CHS	1		20	-	0	0.0	295	220	-
Baltimore	MD Rem	NC Rem	Wilm	156	25%	20	1,950	37.5	37.5	295	220	19,313
Baltimore	MD Rem	SC Rem	CHS	10		20	-	0	0.0	295	220	-
Baltimore	MD Rem	CHS	CHS	14		20	-	0	0.0	295	220	-
			Subtotal	**2158**			**21,350**	**411**	**411**			**187,208**
Portland	Maine	NC Rem	Wilm	90	25%	20	1,125	21.6	21.6	205	220	9,180
Portland	Maine	SC Rem	CHS	42		20	-	0	0.0	205	220	-
Portland	Maine	CHS	CHS	0		20	-	0	0.0	205	220	-
Portland	Maine											
New Bedford	Boston	NC Rem	Wilm	53	25%	20	663	12.7	12.7	205	220	5,398
New Bedford	Boston	SC Rem	CHS			20	-	0	0.0	205	220	-
New Bedford	Boston	CHS	CHS			20	-	0	0.0	205	220	-
New Bedford	Boston											
New Bedford	MA Rem/RI/CTRem	NC Rem	Wilm	26	25%	20	325	6.3	6.3	205	220	2,678
New Bedford	MA Rem/RI/CTRem	SC Rem	CHS			20	-	0	0.0	205	220	-
New Bedford	MA Rem/RI/CTRem	CHS	CHS			20	-	0	0.0	205	220	-
New Bedford	MA Rem/RI/CTRem											
			Subtotal	**211**			**2,113**	**41**	**41**			**17,255**
Southbound Total				**3,446**			**36,925**	**710**	**710**			**321,990**
Northbound Volumes												
Del River	Phil NJ	Maine	Portland	76	25%	20	950	18.3	18.3	230	205	7,961
Del River	Phil NJ	Boston	Boston	0	25%	20	-	0	0.0	230	295	-
Del River	Phil NJ	MA Rem	Boston	0	25%	20	-	0	0.0	230	295	-
												-
Del River	Phil	Maine	Portland	127	25%	20	1,588	30.5	30.5	230	205	13,268
Del River	Phil	Boston	Boston	0	25%	20	-	0	0.0	230	295	-
Del River	Phil	MA Rem	Boston	0	25%	20	-	0	0.0	230	295	-
												-
Baltimore	MD Rem	Maine	Portland	9	25%	20	113	2.2	2.2	295	205	1,100
Baltimore	MD Rem	Boston	New Bedford	79	25%	20	988	19	19.0	295	205	9,500
Baltimore	MD Rem	MA Rem/RI/CTRe	New Bedford	89	25%	20	1,113	21.4	21.4	295	205	10,700
												-
Baltimore	Balt	Maine	Portland	314	25%	20	3,925	75.5	75.5	295	205	37,750
Baltimore	Balt	Boston	New Bedford	348	25%	20	4,350	83.7	83.7	295	205	41,850
Baltimore	Balt	MA Rem/RI/CTRe	New Bedford	113	25%	20	1,413	27.2	27.2	295	205	13,600
			Subtotal	**1155**			**14,438**	**278**	**278**			**135,728**
Wilm	NC Rem	Phil NJ	Del River	205	25%	20	2,563	49.3	49.3	220	230	22,185
CHS	SC Rem	Phil NJ	Del River	117		20	-	0	0.0	220	230	-
CHS	CHS	Phil NJ	Del River	8		20	-	0	0.0	220	230	-
												-
Wilm	NC Rem	Phil	Del River	298	25%	20	3,725	71.6	71.6	220	230	32,220
CHS	SC Rem	Phil	Del River	449		20	-	0	0.0	220	230	-
CHS	CHS	Phil	Del River	2		20	-	0	0.0	220	230	-
												-
Wilm	NC Rem	Baltimore	Baltimore	0	25%	20	-	0	0.0	220	295	-
CHS	SC Rem	Baltimore	Baltimore	150		20	-	0	0.0	220	295	-
CHS	CHS	Baltimore	Baltimore	3		20	-	0	0.0	220	295	-

Service Option 4 (cont'd)

Service Option 4 – Coastal Pendulum (Balt)

Port Rotation: Nw Bed – Portlnd – Del Riv – Balt – Wilm – Balt – Del Riv – Nw Bed **1 Voy/wk** (same as 6, but no CHS call)

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
Wilm	NC Rem	MD Rem	Baltimore	122	25%	20	1,525	29.3	29.3	220	295	15,090
CHS	SC Rem	MD Rem	Baltimore	70		20	-	0	0.0	220	295	-
CHS	CHS	MD Rem	Baltimore	6		20	-	0	0.0	220	295	-
			Subtotal	**1430**			**7,813**	**150**	**150**			**69,495**
Wilm	NC Rem	Maine	Portland	64	25%	20	800	15.4	15.4	220	205	6,545
CHS	SC Rem	Maine	Portland	52		20	-	0	0.0	220	205	-
CHS	CHS	Maine	Portland	10		20	-	0	0.0	220	205	-
												-
Wilm	NC Rem	Boston	New Bedford	349	25%	20	4,363	83.9	83.9	220	205	35,658
CHS	SC Rem	Boston	New Bedford	121		20	-	0	0.0	220	205	-
CHS	CHS	Boston	New Bedford	46		20	-	0	0.0	220	205	-
Wilm	NC Rem	MA Rem/RI/CTRe	New Bedford	104	25%	20	1,300	25	25.0	220	205	10,625
CHS	SC Rem	MA Rem	New Bedford			20	-	0	0.0	220	205	-
CHS	CHS	MA Rem	New Bedford			20	-	0	0.0	220	205	-
			Subtotal	**746**			**6,463**	**124**	**124**			**52,828**
Northbound Total				**3,331**			**28,713**	**552**	**552**			**258,050**

Flow Im-Balances	Disch	Load	Balance	
Portland	142	224	-82	145
Boston	0	0	0	215
Del River	305	422	-117	145
Baltimore	104	267	-162	215
Wilm	451	275	177	160
CHS	0	0	0	160
Total	1002	1187	-184	-

Grand Total **Loads Carried: 1,263** **Handling Costs 580,040**

Handling Cost Per Load $ 459

Volume / Week

Southbound

Dest:	**Origin:** North	Central	SB Lds by Dest
North			0
Central	259		259
South	41	411	451
On/Bd dep:	300	451	710
	SB1	SB2	

Northbound

Dest:	**Origin** South	Central	NB Lds by Dest
North	124	278	402
Central	150		150
South			0
n/Bd dep:	275	402	552
	NB1	NB2	

Cap Limited Volume:	SB1	SB2		NB1	NB2		Total For Week	
Sail/Week	2	2		2	2			90% max avg utilization
Cap/Sail	255	255		255	255			
Cap/Week	510	510		510	510			
Exclude Volume	-	-	-	-	-	-		
Expected Volume	300	451	710	275	402	552	1263	580,040 Handling Costs

Service Option 5

Service Option 5 – Coastal Pendulum
Port Rotation: Nw Bed – Portlnd – Del Riv – Balt – Charl – Wilm – Balt – Nw Bed **1 Voy/wk** (same as 6, but no DelRiver NB call)

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
Southbound Volumes:												
Portland	Maine	Phil NJ	Del River	460	25%	20	5,750	110.6	110.6	205	230	48,111
Portland	Maine	Phil	Del River	306	25%	20	3,825	73.6	73.6	205	230	32,016
Portland	Maine	Baltimore	Baltimore	62	25%	20	775	14.9	14.9	205	295	7,450
Portland	Maine	MD Rem	Baltimore	13	25%	20	163	3.1	3.1	205	295	1,550
New Bedford	Boston	Phil NI	Del River	-	25%	20	-	0	0.0	205	230	-
New Bedford	Boston	Phil	Del River	-	25%	20	-	0	0.0	205	230	-
New Bedford	Boston	MD Rem	Baltimore	69	25%	20	863	16.6	16.6	205	295	8,300
New Bedford	Boston	Balt	Baltimore	88	25%	20	1,100	21.2	21.2	205	295	10,600
New Bedford	MA Rem/RI/CTRem	Phil NI	Del River	-	25%	20	-	0	0.0	205	230	-
New Bedford	MA Rem/RI/CTRem	Phil	Del River	-	25%	20	-	0	0.0	205	230	-
New Bedford	MA Rem/RI/CTRem	MD Rem	Baltimore	36	25%	20	450	8.7	8.7	205	295	4,350
New Bedford	MA Rem/RI/CTRem	Balt	Baltimore	43	25%	20	538	10.3	10.3	205	295	5,150
			Subtotal	**1077**			**13,463**	**259**	**259**			**117,527**
Del River	Phil NJ	NC Rem	Wilm	123	25%	20	1,538	29.6	29.6	230	220	13,320
Del River	Phil NJ	SC Rem	CHS	23	25%	20	288	5.5	5.5	230	220	2,475
Del River	Phil NJ	CHS	CHS	3	25%	20	38	0.7	0.7	230	220	315
Del River	Phil	NC Rem	Wilm	1429	25%	20	17,863	343.5	343.5	230	220	154,575
Del River	Phil	SC Rem	CHS	95	25%	20	1,188	22.8	22.8	230	220	10,260
Del River	Phil	CHS	CHS	9	25%	20	113	2.2	2.2	230	220	990
Baltimore	Baltimore	NC Rem	Wilm	0	25%	20	-	0	0.0	295	220	-
Baltimore	Baltimore	SC Rem	CHS	3	25%	20	38	0.7	0.7	295	220	361
Baltimore	Baltimore	CHS	CHS	1	25%	20	13	0.2	0.2	295	220	103
Baltimore	MD Rem	NC Rem	Wilm	0	25%	20	-	0	0.0	295	220	-
Baltimore	MD Rem	SC Rem	CHS	3	25%	20	38	0.7	0.7	295	220	361
Baltimore	MD Rem	CHS	CHS	1	25%	20	13	0.2	0.2	295	220	103
			Subtotal	**1690**			**21,125**	**406**	**406**			**182,862**
Portland	Maine	NC Rem	Wilm	90	25%	20	1,125	21.6	21.6	205	220	9,180
Portland	Maine	SC Rem	CHS	42	25%	20	525	10.1	10.1	205	220	4,293
Portland	Maine	CHS	CHS	0	25%	20	-	0	0.0	205	220	-
Portland	Maine											
New Bedford	Boston	NC Rem	Wilm	53	25%	20	663	12.7	12.7	205	220	5,398
New Bedford	Boston	SC Rem	CHS	20	25%	20	250	4.8	4.8	205	220	2,040
New Bedford	Boston	CHS	CHS	6	25%	20	75	1.4	1.4	205	220	595
New Bedford	Boston											
New Bedford	MA Rem/RI/CTRem	NC Rem	Wilm	26	25%	20	325	6.3	6.3	205	220	2,678
New Bedford	MA Rem/RI/CTRem	SC Rem	CHS	21	25%	20	263	5	5.0	205	220	2,125
New Bedford	MA Rem/RI/CTRem	CHS	CHS	3	25%	20	38	0.7	0.7	205	220	298
New Bedford	MA Rem/RI/CTRem											
			Subtotal	**261**			**3,263**	**63**	**63**			**26,605**
Southbound Total				**3,028**			**37,850**	**728**	**728**			**326,994**
Northbound Volumes												
Del River	Phil NJ	Maine	Portland	76	25%	20	950	18.3	18.3	230	205	7,961
Del River	Phil NJ	Boston	New Bedford	0	25%	20	-	0	0.0	230	205	-
Del River	Phil NJ	MA Rem/RI/CTI	New Bedford	0	25%	20	-	0	0.0	230	205	-
												-
Del River	Phil	Maine	Portland	127	25%	20	1,588	30.5	30.5	230	205	13,268
Del River	Phil	Boston	New Bedford	0	25%	20	-	0	0.0	230	205	-
Del River	Phil	MA Rem/RI/CTI	New Bedford	0	25%	20	-	0	0.0	230	205	-
												-
Baltimore	MD Rem	Maine	Portland	9	25%	20	113	2.2	2.2	295	205	1,100
Baltimore	MD Rem	Boston	New Bedford	79	25%	20	988	19	19.0	295	205	9,500
Baltimore	MD Rem	MA Rem/RI/CTI	New Bedford	89	25%	20	1,113	21.4	21.4	295	205	10,700
												-
Baltimore	Balt	Maine	Portland	314	25%	20	3,925	75.5	75.5	295	205	37,750
Baltimore	Balt	Boston	New Bedford	348	25%	20	4,350	83.7	83.7	295	205	41,850
Baltimore	Balt	MA Rem/RI/CTI	New Bedford	113	25%	20	1,413	27.2	27.2	295	205	13,600
			Subtotal	**1155**			**14,438**	**278**	**278**			**135,728**
Wilm	NC Rem	Phil NJ	Del River	205		20	-	0	0.0	220	230	-
CHS	SC Rem	Phil NJ	Del River	117		20	-	0	0.0	220	230	-
CHS	CHS	Phil NJ	Del River	8		20	-	0	0.0	220	230	-
												-
Wilm	NC Rem	Phil	Del River	298		20	-	0	0.0	220	230	-
CHS	SC Rem	Phil	Del River	449		20	-	0	0.0	220	230	-
CHS	CHS	Phil	Del River	2		20	-	0	0.0	220	230	-
												-
Wilm	NC Rem	Baltimore	Baltimore	0	25%	20	-	0	0.0	220	295	-
CHS	SC Rem	Baltimore	Baltimore	159	25%	20	1,988	38.2	38.2	220	295	19,673
CHS	CHS	Baltimore	Baltimore	3	25%	20	38	0.7	0.7	220	295	361

Service Option 5 (cont'd)

Service Option 5 – Coastal Pendulum

Port Rotation: Nw Bed – Portlnd – Del Riv – Balt – Charl – Wilm – Balt – Nw Bed **1 Voy/wk** (same as 6, but no DelRiver NB call)

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
Wilm	NC Rem	MD Rem	Baltimore	122	25%	20	1,525	29.3	29.3	220	295	15,090
CHS	SC Rem	MD Rem	Baltimore	70	25%	20	875	16.8	16.8	220	295	8,652
CHS	CHS	MD Rem	Baltimore	6	25%	20	75	1.4	1.4	220	295	721
			Subtotal	**1439**			**4,500**	**86**	**86**			**44,496**
Wilm	NC Rem	Maine	Portland	64	25%	20	800	15.4	15.4	220	205	6,545
CHS	SC Rem	Maine	Portland	52	25%	20	650	12.5	12.5	220	205	5,313
CHS	CHS	Maine	Portland	10	25%	20	125	2.4	2.4	220	205	1,020
												-
Wilm	NC Rem	Boston	New Bedford	349	25%	20	4,363	83.9	83.9	220	205	35,658
CHS	SC Rem	Boston	New Bedford	121	25%	20	1,513	29.1	29.1	220	205	12,368
CHS	CHS	Boston	New Bedford	46	25%	20	575	11.1	11.1	220	205	4,718
Wilm	NC Rem	MA Rem/RI/CTI	New Bedford	104	25%	20	1,300	25	25.0	220	205	10,625
CHS	SC Rem	MA Rem/RI/CTI	New Bedford	118	25%	20	1,475	28.4	28.4	220	205	12,070
CHS	CHS	MA Rem/RI/CTI	New Bedford	24	25%	20	300	5.8	5.8	220	205	2,465
			Subtotal	**888**			**11,100**	**214**	**214**			**90,780**
Northbound Total				**3,482**			**30,038**	**578**	**578**			**271,004**

Flow Im-Balances	Disch	Load	Balance		
Portland	157	234	-77	145	
Boston	0	0	0	215	
Del River	184	453	-269	145	
Baltimore	161	231	-70	215	
Wilm	414	154	260	160	
CHS	55	146	-91	160	
Total	971	1218	-247		-

Grand Total **Loads Carried:** **1,306** **Handling Costs** **597,998**
Handling Cost Per Load **$ 458**

Volume / Week

	Southbound Origin: North	Central	SB Lds by Dest	Northbound Origin South	Central	NB Lds by Dest	Total For Week
Dest: North			0	214	278	491	
Central	259		259	86		86	
South	63	406	469			0	
On/Bd dep:	322	469	728	300	491	578	
	SB1	SB2		NB1	NB2		
Cap Limited Volume:							
Sail/Week	2	2		2	2		
Cap/Sail	255	255		255	255		
Cap/Week	510	510		510	510		
Capac Restricted Volume	-	(10)	(10)	-	(32)	(32)	
Expected On Bd	322	459	718	300	459	545	1263
Per Voyage	161	230		150	230		

90% max avg utilization

578,714 Handling Costs Adjusted For Volume

Service Recap

Voy Option	Cap - Units Per Voy	Voy Days	Vsl Voy Costs	Vsl Own/Op	Fuel Costs	Port Calls	Avg Speed
a) Opt 8 vsl03 7day	255	7.0	902	447.8	334.8	119.5	22.0

Service Option 6

Service Option 6 – Coastal Pendulum
Port Rotation: Nw Bed – Portlnd – Del Riv – Norfolk – Charl – Wilm – Norfolk – Del Riv – Nw Bed **1 Voy/wk**

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
Southbound Volumes:												
Portland	Maine	Phil NJ	Del River	460	25%	20	5,750	110.6	110.6	205	230	48,111
Portland	Maine	Phil	Del River	306	25%	20	3,825	73.6	73.6	205	230	32,016
Portland	Maine	Norfolk	Norfolk	6	25%	20	75	1.4	1.4	205	295	700
Portland	Maine	Richmond	Norfolk	59	25%	20	738	14.2	14.2	205	295	7,100
New Bedford	Boston	Phil NJ	Del River	0	25%	20	-	0	0.0	205	230	-
New Bedford	Boston	Phil	Del River	0	25%	20	-	0	0.0	205	230	-
New Bedford	Boston	Norfolk	Norfolk	15	25%	20	188	3.6	3.6	205	295	1,800
New Bedford	Boston	Richmond	Norfolk	68	25%	20	850	16.3	16.3	205	295	8,150
New Bedford	MA Rem/RI/CTRem	Phil NJ	Del River	0	25%	20	-	0	0.0	205	230	-
New Bedford	MA Rem/RI/CTRem	Phil	Del River	0	25%	20	-	0	0.0	205	230	-
New Bedford	MA Rem/RI/CTRem	Norfolk	Norfolk	70	25%	20	875	16.8	16.8	205	295	8,400
New Bedford	MA Rem/RI/CTRem	Richmond	Norfolk	31	25%	20	388	7.5	7.5	205	295	3,750
			Subtotal	**1015**			**12,688**	**244**	**244**			**110,027**
Del River	Phil NJ	NC Rem	Wilm	123	25%	20	1,538	29.6	29.6	230	220	13,320
Del River	Phil NJ	SC Rem	CHS	23	25%	20	288	5.5	5.5	230	220	2,475
Del River	Phil NJ	CHS	CHS	3	25%	20	38	0.7	0.7	230	220	315
Del River	Phil	NC Rem	Wilm	1429	25%	20	17,863	343.5	343.5	230	220	154,575
Del River	Phil	SC Rem	CHS	95	25%	20	1,188	22.8	22.8	230	220	10,260
Del River	Phil	CHS	CHS	9	25%	20	113	2.2	2.2	230	220	990
Norfolk	Norfolk	NC Rem	Wilm	0	25%	20	-	0	0.0	295	220	-
Norfolk	Norfolk	SC Rem	CHS	0	25%	20	-	0	0.0	295	220	-
Norfolk	Norfolk	CHS	CHS	0	25%	20	-	0	0.0	295	220	-
Norfolk	Richmond	NC Rem	Wilm	0	25%	20	-	0	0.0	295	220	-
Norfolk	Richmond	SC Rem	CHS	0	25%	20	-	0	0.0	295	220	-
Norfolk	Richmond	CHS	CHS	0	25%	20	-	0	0.0	295	220	-
			Subtotal	**1682**			**21,025**	**404**	**404**			**181,935**
Portland	Maine	NC Rem	Wilm	90	25%	20	1,125	21.6	21.6	205	220	9,180
Portland	Maine	SC Rem	CHS	42	25%	20	525	10.1	10.1	205	220	4,293
Portland	Maine	CHS	CHS	0	25%	20	-	0	0.0	205	220	-
Portland	Maine											
New Bedford	Boston	NC Rem	Wilm	53	25%	20	663	12.7	12.7	205	220	5,398
New Bedford	Boston	SC Rem	CHS	20	25%	20	250	4.8	4.8	205	220	2,040
New Bedford	Boston	CHS	CHS	6	25%	20	75	1.4	1.4	205	220	595
New Bedford	Boston											
New Bedford	MA Rem/RI/CTRem	NC Rem	Wilm	26	25%	20	325	6.3	6.3	205	220	2,678
New Bedford	MA Rem/RI/CTRem	SC Rem	CHS	21	25%	20	263	5	5.0	205	220	2,125
New Bedford	MA Rem/RI/CTRem	CHS	CHS	3	25%	20	38	0.7	0.7	205	220	298
New Bedford	MA Rem/RI/CTRem											
			Subtotal	**261**			**3,263**	**63**	**63**	1845	1980	**26,605**
Southbound Total				**2,958**			**36,975**	**711**	**711**			**318,567**
Northbound Volumes												
Del River	Phil NJ	Maine	Portland	76	25%	20	950	18.3	18.3	230	205	7,961
Del River	Phil NJ	Boston	New Bedford	0	25%	20	-	0	0.0	230	205	-
Del River	Phil NJ	MA Rem/RI/CTRe	New Bedford	0	25%	20	-	0	0.0	230	205	-
												-
Del River	Phil	Maine	Portland	127	25%	20	1,588	30.5	30.5	230	205	13,268
Del River	Phil	Boston	New Bedford	0	25%	20	-	0	0.0	230	205	-
Del River	Phil	MA Rem/RI/CTRe	New Bedford	0	25%	20	-	0	0.0	230	205	-
												-
Norfolk	Norfolk	Maine	Portland	6	25%	20	75	1.4	1.4	295	205	700
Norfolk	Norfolk	Boston	New Bedford	30	25%	20	375	7.2	7.2	295	205	3,600
Norfolk	Norfolk	MA Rem/RI/CTRe	New Bedford	36	25%	20	450	8.7	8.7	295	205	4,350
												-
Norfolk	Richmond	Maine	Portland	11	25%	20	138	2.6	2.6	295	205	1,300
Norfolk	Richmond	Boston	New Bedford	155	25%	20	1,938	37.3	37.3	295	205	18,650
Norfolk	Richmond	MA Rem/RI/CTRe	New Bedford	26	25%	20	325	6.3	6.3	295	205	3,150
			Subtotal	**467**			**5,838**	**112**	**112**			**52,978**
Wilm	NC Rem	Phil NJ	Del River	205	25%	20	2,563	49.3	49.3	220	230	22,185
CHS	SC Rem	Phil NJ	Del River	117	25%	20	1,463	28.1	28.1	220	230	12,645
CHS	CHS	Phil NJ	Del River	8	25%	20	100	1.9	1.9	220	230	855
												-
Wilm	NC Rem	Phil	Del River	298	25%	20	3,725	71.6	71.6	220	230	32,220
CHS	SC Rem	Phil	Del River	449	25%	20	5,613	107.9	107.9	220	230	48,555
CHS	CHS	Phil	Del River	2	25%	20	25	0.5	0.5	220	230	225
												-
Wilm	NC Rem	Norfolk	Norfolk	0	25%	20	-	0	0.0	220	295	-
CHS	SC Rem	Norfolk	Norfolk	0	25%	20	-	0	0.0	220	295	-
CHS	CHS	Norfolk	Norfolk	0	25%	20	-	0	0.0	220	295	-
Wilm	NC Rem	Richmond	Norfolk	0	25%	20	-	0	0.0	220	295	-
CHS	SC Rem	Richmond	Norfolk	0	25%	20	-	0	0.0	220	295	-

Service Option 6 (cont'd)

Service Option 6 – Coastal Pendulum

Port Rotation: Nw Bed – Portlnd – Del Riv – Norfolk – Charl – Wilm – Norfolk – Del Riv – Nw Bed **1 Voy/wk**

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
CHS	CHS	Richmond	Norfolk	0	25%	20	-	0	0.0	220	295	-
			Subtotal	**1079**			**13,488**	**259**	**259**			**116,685**
Wilm	NC Rem	Maine	Portland	64	25%	20	800	15.4	15.4	220	205	6,545
CHS	SC Rem	Maine	Portland	52	25%	20	650	12.5	12.5	220	205	5,313
CHS	CHS	Maine	Portland	10	25%	20	125	2.4	2.4	220	205	1,020
												-
Wilm	NC Rem	Boston	New Bedford	349	25%	20	4,363	83.9	83.9	220	205	35,658
CHS	SC Rem	Boston	New Bedford	121	25%	20	1,513	29.1	29.1	220	205	12,368
CHS	CHS	Boston	New Bedford	46	25%	20	575	11.1	11.1	220	205	4,718
Wilm	NC Rem	MA Rem/RI/CTRe	New Bedford	104	25%	20	1,300	25	25.0	220	205	10,625
CHS	SC Rem	MA Rem/RI/CTRe	New Bedford	118	25%	20	1,475	28.4	28.4	220	205	12,070
CHS	CHS	MA Rem/RI/CTRe	New Bedford	24	25%	20	300	5.8	5.8	220	205	2,465
			Subtotal	**888**			**11,100**	**214**	**214**			**90,780**
Northbound Total				**2,434**			**30,425**	**585**	**585**	**-**		**260,443**

Flow Im-Balances	Disch	Load	Balance	
Portland	83	232	-148	145
Boston	0	0	0	215
Del River	444	453	-10	145
Norfolk	60	64	-4	215
Wilm	414	245	169	160
CHS	53	228	-175	160
Total	1053	1221	-168	

Grand Total **Loads Carried:** **1,296** **Handling Costs** **579,010**

Handling Cost Per Load **$ 447**

Volume / Week

	Southbound				**Northbound**			
	Origin:		SB Lds		**Origin**		NB Lds	Total
Dest:	North	Central	by Dest	**Dest:**	South	Central	by Dest	For Week
North			0	North	214	112	326	
Central	244		244	Central	259		259	
South	63	404	467	South			0	
On/Bd dep:	307	467	711	n/Bd dep:	473	326	585	
	SB1	SB2			NB1	NB2		
Cap Limited Volume:								
Sail/Week	2	2			2	2		
Cap/Sail	255	255			255	255		
Cap/Week	510	510			510	510		
Capac Restricted Volume	-	(8)	(8)		(14)	-	(14)	
Expected On Bd	307	459	703		459	326	571	1274
Per Voyage	153	230			230	163		

90% max avg utilization

569,271 Handling Costs Adjusted For Volume

Service Recap Voy Option	Cap - Units Per Voy	Voy Days	Vsl Voy Costs	Vsl Own/Op	Fuel Costs	Port Calls	Avg Speed
a) Opt 6 vsl03 7.5day?	255	7.6	1,080	487.8	445.3	146.5	24.0

Service Option 7

Service Option 7 – Coastal Pendulum

Port Rotation: Nw Bed – Portl – DelRiv – Norfolk – Sav – Norfolk -- Nw Bed **1 Voy/wk** (same as 8, but Savannah call instead of Wilm & Charl calls)

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
Southbound Volumes:												
Portland	Maine	Phil NJ	Del River	460	25%	20	5,750	110.6	110.6	205	230	48,111
Portland	Maine	Phil	Del River	306	25%	20	3,825	73.6	73.6	205	230	32,016
Portland	Maine	Norfolk	Norfolk	6	25%	20	75	1.4	1.4	205	295	700
Portland	Maine	Richmond	Norfolk	59	25%	20	738	14.2	14.2	205	295	7,100
New Bedford	Boston	Phil NJ	Del River	0	25%	20	-	0	0.0	205	230	-
New Bedford	Boston	Phil	Del River	0	25%	20	-	0	0.0	205	230	-
New Bedford	Boston	Norfolk	Norfolk	15	25%	20	188	3.6	3.6	205	295	1,800
New Bedford	Boston	Richmond	Norfolk	68	25%	20	850	16.3	16.3	205	295	8,150
New Bedford	MA Rem/RI/CTRem	Phil NJ	Del River	0	25%	20	-	0	0.0	205	230	-
New Bedford	MA Rem/RI/CTRem	Phil	Del River	0	25%	20	-	0	0.0	205	230	-
New Bedford	MA Rem/RI/CTRem	Norfolk	Norfolk	70	25%	20	875	16.8	16.8	205	295	8,400
New Bedford	MA Rem/RI/CTRem	Richmond	Norfolk	31	25%	20	388	7.5	7.5	205	295	3,750
			Subtotal	**1,015**			**12,688**	**244**	**244**			**110,027**
Del River	Phil NJ	Savannah	SAV	5	25%	20	63	1.2	1.2	230	220	540
Del River	Phil NJ	SC Rem	CHS	23		20	-	0	0.0	230	220	-
Del River	Phil NJ	CHS	CHS	3		20	-	0	0.0	230	220	-
Del River	Phil	Savannah	SAV	25	25%	20	313	6	6.0	230	220	2,700
Del River	Phil	SC Rem	CHS	95		20	-	0	0.0	230	220	-
Del River	Phil	CHS	CHS	9		20	-	0	0.0	230	220	-
Norfolk	Norfolk	Savannah	SAV	1	25%	20	13	0.2	0.2	295	220	103
Norfolk	Norfolk	SC Rem	CHS	0		20	-	0	0.0	295	220	-
Norfolk	Norfolk	CHS	CHS	0		20	-	0	0.0	295	220	-
Norfolk	Richmond	Savannah	SAV	8	25%	20	100	1.9	1.9	295	220	979
Norfolk	Richmond	SC Rem	CHS	0		20	-	0	0.0	295	220	-
Norfolk	Richmond	CHS	CHS	0		20	-	0	0.0	295	220	-
			Subtotal	**169**			**488**	**9**	**9**			**4,322**
Portland	Maine	Savannah	SAV	3	25%	20	38	0.7	0.7	205	220	298
Portland	Maine	SC Rem	CHS	42		20	-	0	0.0	205	220	-
Portland	Maine	CHS	CHS	0		20	-	0	0.0	205	220	-
Portland	Maine											
New Bedford	Boston	Savannah	SAV	5	25%	20	63	1.2	1.2	205	220	510
New Bedford	Boston	SC Rem	CHS	20		20	-	0	0.0	205	220	-
New Bedford	Boston	CHS	CHS	6		20	-	0	0.0	205	220	-
New Bedford	Boston											
New Bedford	MA Rem/RI/CTRem	Savannah	SAV	5	25%	20	63	1.2	1.2	205	220	510
New Bedford	MA Rem/RI/CTRem	SC Rem	CHS	21		20	-	0	0.0	205	220	-
New Bedford	MA Rem/RI/CTRem	CHS	CHS	3		20	-	0	0.0	205	220	-
New Bedford	MA Rem/RI/CTRem											
			Subtotal	**105**			**163**	**3**	**3**			**1,318**
Southbound Total				**1,289**			**13,338**	**256**	**256**			**115,666**
Northbound Volumes												
Del River	Phil NJ	Maine	Portland	76	25%	20	950	18.3	18.3	230	205	7,961
Del River	Phil NJ	Boston	New Bedford	0	25%	20	-	0	0.0	230	205	-
Del River	Phil NJ	MA Rem/RI/CTRem	New Bedford	0	25%	20	-	0	0.0	230	205	-
												-
Del River	Phil	Maine	Portland	127	25%	20	1,588	30.5	30.5	230	205	13,268
Del River	Phil	Boston	New Bedford	0	25%	20	-	0	0.0	230	205	-
Del River	Phil	MA Rem/RI/CTRem	New Bedford	0	25%	20	-	0	0.0	230	205	-
												-
Norfolk	Norfolk	Maine	Portland	6	25%	20	75	1.4	1.4	295	205	700
Norfolk	Norfolk	Boston	New Bedford	30	25%	20	375	7.2	7.2	295	205	3,600
Norfolk	Norfolk	MA Rem/RI/CTRem	New Bedford	26	25%	20	325	6.3	6.3	295	205	3,150
												-
Norfolk	Richmond	Maine	Portland	11	25%	20	138	2.6	2.6	295	205	1,300
Norfolk	Richmond	Boston	New Bedford	155	25%	20	1,938	37.3	37.3	295	205	18,650
Norfolk	Richmond	MA Rem/RI/CTRem	New Bedford	26	25%	20	325	6.3	6.3	295	205	3,150
			Subtotal	**457**			**5,713**	**110**	**110**			**51,778**
SAV	Savannah	Phil NJ	Del River	27	25%	20	338	6.5	6.5	220	230	2,925
CHS	SC Rem	Phil NJ	Del River	117		20	-	0	0.0	220	230	-
CHS	CHS	Phil NJ	Del River	8		20	-	0	0.0	220	230	-
												-
SAV	Savannah	Phil	Del River	135	25%	20	1,688	32.5	32.5	220	230	14,625
CHS	SC Rem	Phil	Del River	449		20	-	0	0.0	220	230	-
CHS	CHS	Phil	Del River	2		20	-	0	0.0	220	230	-
												-
SAV	Savannah	Norfolk	Norfolk	16	25%	20	200	3.8	3.8	220	295	1,957
CHS	SC Rem	Norfolk	Norfolk	0		20	-	0	0.0	220	295	-
CHS	CHS	Norfolk	Norfolk	0		20	-	0	0.0	220	295	-
SAV	Savannah	Richmond	Norfolk	87	25%	20	1,088	20.9	20.9	220	295	10,764
CHS	SC Rem	Richmond	Norfolk	0		20	-	0	0.0	220	295	-

Service Option 7 (cont'd)

Service Option 7 – Coastal Pendulum

Port Rotation: Nw Bed – Portl – DelRiv – Norfolk – Sav – Norfolk -- Nw Bed **1 Voy/wk** (same as 8, but Savannah call instead of Wilm & Charl calls)

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
CHS	CHS	Richmond	Norfolk	0		20	-	0	0.0	220	295	-
			Subtotal	**841**			**3,313**	**64**	**64**			**30,271**
SAV	Savannah	Maine	Portland	35	25%	20	438	8.4	8.4	220	205	3,570
CHS	SC Rem	Maine	Portland	52		20	-	0	0.0	220	205	-
CHS	CHS	Maine	Portland	10		20	-	0	0.0	220	205	-
												-
SAV	Savannah	Boston	New Bedford	78	25%	20	975	18.8	18.8	220	205	7,990
CHS	SC Rem	Boston	New Bedford	121		20	-	0	0.0	220	205	-
CHS	CHS	Boston	New Bedford	46		20	-	0	0.0	220	205	-
SAV	Savannah	MA Rem/RI/CTRem	New Bedford	3	25%	20	38	0.7	0.7	220	205	298
CHS	SC Rem	MA Rem/RI/CTRem	New Bedford	118		20	-	0	0.0	220	205	-
CHS	CHS	MA Rem/RI/CTRem	New Bedford	24		20	-	0	0.0	220	205	-
			Subtotal	**487**			**1,450**	**28**	**28**			**11,858**
Northbound Total				**1,785**			**10,475**	**202**	**202**			**93,906**

Flow Im-Balances	Disch	Load	Balance	
Portland	61	201	-139	145
Boston	0	0	0	215
Del River	223	56	167	145
Norfolk	85	63	21	215
Wilm	0	0	0	160
CHS	0	0	0	160
SAV	12	92	-79	160
Total	381	411	-30	-

Grand Total	**Loads Carried:**	**458**	**Handling Costs** **209,572**
			Handling Cost Per Load **$ 458**

Volume / Week

	Southbound				**Northbound**			
	Origin:		SB Lds		**Origin**		NB Lds	Total
Dest:	North	Central	by Dest	**Dest:**	South	Central	by Dest	For Week
North			0	North	28	110	138	
Central	244		244	Central	64		64	
South	3	9	12	South			0	
On/Bd dep:	247	12	256	n/Bd dep:	92	138	202	
	SB1	SB2			NB1	NB2		
Cap Limited Volume:								90% max avg utilization
Sail/Week	2	2			2	2		
Cap/Sail	255	255			255	255		
Cap/Week	510	510			510	510		
Capac Restricted Volume	-	-	-		-	-	-	
Expected On Bd/wk	247	12	256		92	138	202	458 209,572 Handling Costs

Service Option 8

Service Option 8 – Coastal Pendulum
Port Rotation: Nw Bed – Portlnd – DelRiv – Balt – Mia – Pt. Canav – Balt – DelRiv – Nw Bed **1 Voy/wk**

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
Southbound Volumes:												
Portland	Maine	Phil NJ	Del River	460	25%	20	5,750	110.6	110.6	205	230	48,111
Portland	Maine	Phil	Del River	306	25%	20	3,825	73.6	73.6	205	230	32,016
Portland	Maine	Baltimore	Baltimore	62	25%	20	775	14.9	14.9	205	295	7,450
Portland	Maine	MD Rem	Baltimore	13	25%	20	163	3.1	3.1	205	295	1,550
New Bedford	Boston	Phil NI	Del River	-	25%	20	-	0	0.0	205	230	-
New Bedford	Boston	Phil	Del River	-	25%	20	-	0	0.0	205	230	-
New Bedford	Boston	MD Rem	Baltimore	69	25%	20	863	16.6	16.6	205	295	8,300
New Bedford	Boston	Balt	Baltimore	88	25%	20	1,100	21.2	21.2	205	295	10,600
New Bedford	MA Rem/RI/CTRem	Phil NI	Del River	-	25%	20	-	0	0.0	205	230	-
New Bedford	MA Rem/RI/CTRem	Phil	Del River	-	25%	20	-	0	0.0	205	230	-
New Bedford	MA Rem/RI/CTRem	MD Rem	Baltimore	36	25%	20	450	8.7	8.7	205	295	4,350
New Bedford	MA Rem/RI/CTRem	Balt	Baltimore	43	25%	20	538	10.3	10.3	205	295	5,150
			Subtotal	**1,077**			**13,463**	**259**	**259**			**117,527**
Del River	Phil NJ	Miami	Miami	222	25%	20	2,775	53.4	53.4	230	190	22,428
Del River	Phil NJ	Orlando	Canaveral	22	25%	20	275	5.3	5.3	230	190	2,226
Del River	Phil NJ	Tampa	Canaveral	27	25%	20	338	6.5	6.5	230	190	2,730
Del River	Phil NJ	Jacksonville	Canaveral	6		20	-	0	0.0	230	190	-
Del River	Phil	Miami	Miami	186	25%	20	2,325	44.7	44.7	230	190	18,774
Del River	Phil	Orlando	Canaveral	73	25%	20	913	17.5	17.5	230	190	7,350
Del River	Phil	Tampa	Canaveral	28	25%	20	350	6.7	6.7	230	190	2,814
Del River	Phil	Jacksonville	Canaveral	21		20	-	0	0.0	230	190	-
Baltimore	Baltimore	Miami	Miami	85	25%	20	1,063	20.4	20.4	295	190	9,894
Baltimore	Baltimore	Orlando	Canaveral	12	25%	20	150	2.9	2.9	295	190	1,407
Baltimore	Baltimore	Tampa	Canaveral	156	25%	20	1,950	37.5	37.5	295	190	18,188
Baltimore	Baltimore	Jacksonville	Canaveral	9		20	-	0	0.0	295	190	-
Baltimore	MD Rem	Miami	Miami	13	25%	20	163	3.1	3.1	295	190	1,504
Baltimore	MD Rem	Orlando	Canaveral	10	25%	20	125	2.4	2.4	295	190	1,164
Baltimore	MD Rem	Tampa	Canaveral	11	25%	20	138	2.6	2.6	295	190	1,261
Baltimore	MD Rem	Jacksonville	Canaveral	2		20	-	0	0.0	295	190	-
			Subtotal	**883**			**10,563**	**203**	**203**			**89,739**
Portland	Maine	Miami	Miami	94	25%	20	1,175	22.6	22.6	205	190	8,927
Portland	Maine	Orlando	Canaveral	5	25%	20	63	1.2	1.2	205	190	474
Portland	Maine	Tampa	Canaveral	22	25%	20	275	5.3	5.3	205	190	2,094
Portland	Maine	Jacksonville	Canaveral	22		20				205	190	
New Bedford	Boston	Miami	Miami	91	25%	20	1,138	21.9	21.9	205	190	8,651
New Bedford	Boston	Orlando	Canaveral	23	25%	20	288	5.5	5.5	205	190	2,173
New Bedford	Boston	Tampa	Canaveral	59	25%	20	738	14.2	14.2	205	190	5,609
New Bedford	Boston	Jacksonville	Canaveral	16		20				205	190	
New Bedford	MA Rem/RI/CTRem	Miami	Miami	21	25%	20	263	5	5.0	205	190	1,975
New Bedford	MA Rem/RI/CTRem	Orlando	Canaveral	19	25%	20	238	4.6	4.6	205	190	1,817
New Bedford	MA Rem/RI/CTRem	Tampa	Canaveral	11	25%	20	138	2.6	2.6	205	190	1,027
New Bedford	MA Rem/RI/CTRem	Jacksonville	Canaveral	7		20				205	190	
			Subtotal	**390**			**4,313**	**83**	**83**			**32,746**
Southbound Total				**2,350**			**28,338**	**545**	**545**			**240,011**
Northbound Volumes						20						
Del River	Phil NJ	Maine	Portland	76	25%	20	950	18.3	18.3	230	205	7,961
Del River	Phil NJ	Boston	New Bedford	0	25%	20	-	0	0.0	230	205	-
Del River	Phil NJ	MA Rem/RI/CTRe	New Bedford	0	25%	20	-	0	0.0	230	205	-
												-
Del River	Phil	Maine	Portland	127	25%	20	1,588	30.5	30.5	230	205	13,268
Del River	Phil	Boston	New Bedford	0	25%	20	-	0	0.0	230	205	-
Del River	Phil	MA Rem/RI/CTRe	New Bedford	0	25%	20	-	0	0.0	230	205	-
												-
Baltimore	MD Rem	Maine	Portland	9	25%	20	113	2.2	2.2	295	205	1,100
Baltimore	MD Rem	Boston	New Bedford	79	25%	20	988	19	19.0	295	205	9,500
Baltimore	MD Rem	MA Rem/RI/CTRe	New Bedford	89	25%	20	1,113	21.4	21.4	295	205	10,700
												-
Baltimore	Balt	Maine	Portland	314	25%	20	3,925	75.5	75.5	295	205	37,750
Baltimore	Balt	Boston	New Bedford	348	25%	20	4,350	83.7	83.7	295	205	41,850
Baltimore	Balt	MA Rem/RI/CTRe	New Bedford	113	25%	20	1,413	27.2	27.2	295	205	13,600
			Subtotal	**1,155**		20	**14,438**	**278**	**278**			**135,728**
Miami	Miami	Phil NJ	Del River	7	25%	20	88	1.7	1.7	190	230	714
Canaveral	Orlando	Phil NJ	Del River	2	25%	20	25	0.5	0.5	190	230	210
Canaveral	Tampa	Phil NJ	Del River	2	25%	20	25	0.5	0.5	190	230	210
Canaveral	Jacksonville	Phil NJ	Del River	2		20	-	0	0.0	190	230	-
												-
Miami	Miami	Phil	Del River	263	25%	20	3,288	63.2	63.2	190	230	26,544
Canaveral	Orlando	Phil	Del River	9	25%	20	113	2.2	2.2	190	230	924
Canaveral	Tampa	Phil	Del River	47	25%	20	588	11.3	11.3	190	230	4,746
Canaveral	Jacksonville	Phil	Del River	18		20	-	0	0.0	190	230	-
												-

Service Option 8 (cont'd)

Service Option 8 – Coastal Pendulum

Port Rotation: Nw Bed – Portlnd – DelRiv – Balt – Mia – Pt. Canav – Balt – DelRiv – Nw Bed **1 Voy/wk**

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
Miami	Miami	Baltimore	Baltimore	52	25%	20	650	12.5	12.5	190	295	6,063
Canaveral	Orlando	Baltimore	Baltimore	5	25%	20	63	1.2	1.2	190	295	582
Canaveral	Tampa	Baltimore	Baltimore	18	25%	20	225	4.3	4.3	190	295	2,086
Canaveral	Jacksonville	Baltimore	Baltimore	15		20	-	0	0.0	190	295	-
Miami	Miami	MD Rem	Baltimore	5	25%	20	63	1.2	1.2	190	295	582
Canaveral	Orlando	MD Rem	Baltimore	10	25%	20	125	2.4	2.4	190	295	1,164
Canaveral	Tampa	MD Rem	Baltimore	12	25%	20	150	2.9	2.9	190	295	1,407
Canaveral	Jacksonville	MD Rem	Baltimore	1		20	-	0	0.0	190	295	-
			Subtotal	**468**			**5,400**	**104**	**104**			**45,231**
Miami	Miami	Maine	Portland	4	25%	20	50	1	1.0	190	205	395
Canaveral	Orlando	Maine	Portland	4	25%	20	50	1	1.0	190	205	395
Canaveral	Tampa	Maine	Portland	3	25%	20	38	0.7	0.7	190	205	277
Canaveral	Jacksonville	Maine	Portland	4		20	-	0	0.0	190	205	-
Miami	Miami	Boston	New Bedford	59	25%	20	738	14.2	14.2	190	205	5,609
Canaveral	Orlando	Boston	New Bedford	27	25%	20	338	6.5	6.5	190	205	2,568
Canaveral	Tampa	Boston	New Bedford	72	25%	20	900	17.3	17.3	190	205	6,834
Canaveral	Jacksonville	Boston	New Bedford	46		20	-	0	0.0	190	205	-
Miami	Miami	MA Rem/RI/CTRe	New Bedford	8	25%	20	100	1.9	1.9	190	205	751
Canaveral	Orlando	MA Rem/RI/CTRe	New Bedford	14	25%	20	175	3.4	3.4	190	205	1,343
Canaveral	Tampa	MA Rem/RI/CTRe	New Bedford	49	25%	20	613	11.8	11.8	190	205	4,661
Canaveral	Jacksonville	MA Rem/RI/CTRe	New Bedford	1		20	-	0	0.0	190	205	-
			Subtotal	**291**			**3,000**	**58**	**58**			**22,831**
Northbound Total				**1,914**			**22,838**	**440**	**440**			**203,790**

Flow Im-Balances	Disch	Load	Balance	
Portland	129	231	-102	145
Boston	0	0	0	215
Del River	264	183	81	145
Baltimore	99	298	-199	215
Canaveral	115	66	49	140
Miami	171	96	75	140
Total	778	874	-96	-

Grand Total **Loads Carried:** **984** **Handling Costs** **443,801**
Handling Cost Per Load **$ 451**

Volume / Week

Southbound

Origin: / **Dest:**	North	Central	SB Lds by Dest
North			0
Central	259		259
South	83	203	286
On/Bd dep:	342	286	545
	SB1	SB2	
Cap Limited Volume - Ship Type 4			
Sail/Week	2	2	
Cap/Sail	314	314	
Cap/Week	628	628	
Capac Restricted Volume	-	-	-
Expected On Bd/wk	342	286	545
Per Voyage	171	143	
Cap Limited Volume - Ship Type 1			
Sail/Week	2	2	
Cap/Sail	151	151	
Cap/Week	302	302	
Capac Restricted Volume	(70)		(70)
Expected On Bd/wk	272	286	475
Per Voyage	136	143	

Northbound

Origin / **Dest:**	South	Central	NB Lds by Dest	Total For Week
North	58	278	336	
Central	104		104	
South			0	
n/Bd dep:	162	336	440	984
	NB1	NB2		
	2	2		
	314	314		
	628	628		
	-	-	-	
	162	336	440	984
	81	168		
	2	2		
	151	151		
	302	302		
	-	(64)	(64)	
	162	272	376	851
	81	136		

90% max avg utilization

443,801 Handling Costs Adjusted For Volume

90% max avg utilization

383,434 Handling Costs Adjusted For Volume

Service Recap Voy Option	Cap - Units Per Voy	Voy Days	Vsl Voy Costs	Vsl Own/Op	Fuel Costs	Port Calls	Avg Speed
a) Opt 10 vsl04 10.5day	314	10.5	1,124	606.9	358.0	159.5	17.1
b) Opt 10 vsl01 10.5day	151	10.5	978	500.2	333.4	144.2	17.1

Service Option 9

Service Option 9 – Coastal Pendulum

Port Rotation: Nw Bed – Portlnd – NYNJ – Norf. – Mia – Pt. Canav – Norf. – NYNJ – Nw Bed **1 Voy/wk**

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
Southbound Volumes:												
Portland	Maine	NY NY	NYNJ	0	25%	20	-	0	0.0	205	300	-
Portland	Maine	NY NJ	NYNJ	0	25%	20	-	0	0.0	205	300	-
Portland	Maine	Norfolk	Norfolk	6	25%	20	75	1.4	1.4	205	295	700
Portland	Maine	Richmond	Norfolk	59	25%	20	738	14.2	14.2	205	295	7,100
New Bedford	Boston	NY NY	NYNJ	0	25%	20	-	0	0.0	205	300	-
New Bedford	Boston	NY NJ	NYNJ	0	25%	20	-	0	0.0	205	300	-
New Bedford	Boston	Norfolk	Norfolk	15	25%	20	188	3.6	3.6	205	295	1,800
New Bedford	Boston	Richmond	Norfolk	68	25%	20	850	16.3	16.3	205	295	8,150
New Bedford	MA Rem/RI/CTRem	NY NY	NYNJ	0	25%	20	-	0	0.0	205	300	-
New Bedford	MA Rem/RI/CTRem	NY NJ	NYNJ	0	25%	20	-	0	0.0	205	300	-
New Bedford	MA Rem/RI/CTRem	Norfolk	Norfolk	70	25%	20	875	16.8	16.8	205	295	8,400
New Bedford	MA Rem/RI/CTRem	Richmond	Norfolk	31	25%	20	388	7.5	7.5	205	295	3,750
			Subtotal	**249**			**3,113**	**60**	**60**			**29,900**
NYNJ	NY NY	Miami	Miami	494	25%	20	6,175	118.8	118.8	300	190	58,212
NYNJ	NY NY	Orlando	Canaveral	184	25%	20	2,300	44.2	44.2	300	190	21,658
NYNJ	NY NY	Tampa	Canaveral	281	25%	20	3,513	67.5	67.5	300	190	33,075
NYNJ	NY NY	Jacksonville	Canaveral	46		20	-	0	0.0	300	190	-
NYNJ	NY NJ	Miami	Miami	277	25%	20	3,463	66.6	66.6	300	190	32,634
NYNJ	NY NJ	Orlando	Canaveral	94	25%	20	1,175	22.6	22.6	300	190	11,074
NYNJ	NY NJ	Tampa	Canaveral	86	25%	20	1,075	20.7	20.7	300	190	10,143
NYNJ	NY NJ	Jacksonville	Canaveral	48		20	-	0	0.0	300	190	-
Norfolk	Norfolk	Miami	Miami	86	25%	20	1,075	20.7	20.7	295	190	10,040
Norfolk	Richmond	Orlando	Canaveral	95	25%	20	1,188	22.8	22.8	295	190	11,058
Norfolk	Richmond	Tampa	Canaveral	19	25%	20	238	4.6	4.6	295	190	2,231
Norfolk	Richmond	Jacksonville	Canaveral	30		20	-	0	0.0	295	190	-
			Subtotal	**1,740**			**20,200**	**389**	**389**			**190,125**
Portland	Maine	Miami	Miami	94	25%	20	1,175	22.6	22.6	205	190	8,927
Portland	Maine	Orlando	Canaveral	5	25%	20	63	1.2	1.2	205	190	474
Portland	Maine	Tampa	Canaveral	22	25%	20	275	5.3	5.3	205	190	2,094
Portland	Maine	Jacksonville	Canaveral	22						205	190	
New Bedford	Boston	Miami	Miami	91	25%	20	1,138	21.9	21.9	205	190	8,651
New Bedford	Boston	Orlando	Canaveral	23	25%	20	288	5.5	5.5	205	190	2,173
New Bedford	Boston	Tampa	Canaveral	59	25%	20	738	14.2	14.2	205	190	5,609
New Bedford	Boston	Jacksonville	Canaveral	16						205	190	
New Bedford	MA Rem/RI/CTRem	Miami	Miami	21	25%	20	263	5	5.0	205	190	1,975
New Bedford	MA Rem/RI/CTRem	Orlando	Canaveral	19	25%	20	238	4.6	4.6	205	190	1,817
New Bedford	MA Rem/RI/CTRem	Tampa	Canaveral	11	25%	20	138	2.6	2.6	205	190	1,027
New Bedford	MA Rem/RI/CTRem	Jacksonville	Canaveral	7						205	190	
			Subtotal	**390**			**4,313**	**83**	**83**			**32,746**
Southbound Total				**2,379**			**27,625**	**531**	**531**			**252,770**
Northbound Volumes												
NYNJ	NY NY	Maine	Portland	0	25%	20	-	0	0.0	300	205	-
NYNJ	NY NY	Boston	New Bedford	0	25%	20	-	0	0.0	300	205	-
NYNJ	NY NY	MA Rem/RI/CTRem	New Bedford	0	25%	20	-	0	0.0	300	205	-
												-
NYNJ	NY NJ	Maine	Portland	0	25%	20	-	0	0.0	300	205	-
NYNJ	NY NJ	Boston	New Bedford	0	25%	20	-	0	0.0	300	205	-
NYNJ	NY NJ	MA Rem/RI/CTRem	New Bedford	0	25%	20	-	0	0.0	300	205	-
												-
Norfolk	Norfolk	Maine	Portland	6	25%	20	75	1.4	1.4	295	205	700
Norfolk	Norfolk	Boston	New Bedford	30	25%	20	375	7.2	7.2	295	205	3,600
Norfolk	Norfolk	MA Rem/RI/CTRem	New Bedford	36	25%	20	450	8.7	8.7	295	205	4,350
												-
Norfolk	Richmond	Maine	Portland	11	25%	20	138	2.6	2.6	295	205	1,300
Norfolk	Richmond	Boston	New Bedford	155	25%	20	1,938	37.3	37.3	295	205	18,650
Norfolk	Richmond	MA Rem/RI/CTRem	New Bedford	26	25%	20	325	6.3	6.3	295	205	3,150
			Subtotal	**264**			**3,300**	**64**	**64**			**31,750**
Miami	Miami	NY NY	NYNJ	140	25%	20	1,750	33.7	33.7	190	300	16,513
Canaveral	Orlando	NY NY	NYNJ	73	25%	20	913	17.5	17.5	190	300	8,575
Canaveral	Tampa	NY NY	NYNJ	186	25%	20	2,325	44.7	44.7	190	300	21,903
Canaveral	Jacksonville	NY NY	NYNJ	16		20	-	0	0.0	190	300	-
												-
Miami	Miami	NY NJ	NYNJ	62	25%	20	775	14.9	14.9	190	300	7,301
Canaveral	Orlando	NY NJ	NYNJ	38	25%	20	475	9.1	9.1	190	300	4,459
Canaveral	Tampa	NY NJ	NYNJ	53	25%	20	663	12.7	12.7	190	300	6,223
Canaveral	Jacksonville	NY NJ	NYNJ	23		20	-	0	0.0	190	300	-
												-
Miami	Miami	Norfolk	Norfolk	20	25%	20	250	4.8	4.8	190	295	2,328
Canaveral	Orlando	Norfolk	Norfolk	15	25%	20	188	3.6	3.6	190	295	1,746
Canaveral	Tampa	Norfolk	Norfolk	21	25%	20	263	5	5.0	190	295	2,425
Canaveral	Jacksonville	Norfolk	Norfolk	6		20	-	0	0.0	190	295	-

Service Option 9 (cont'd)

Service Option 9 – Coastal Pendulum

Port Rotation: Nw Bed – PortInd – NYNJ – Norf. – Mia – Pt. Canav – Norf. – NYNJ – Nw Bed **1 Voy/wk**

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	Lds/Voy	$/Unit Loading	$/Unit Discharge	Handling Cost/ Voyage
			Subtotal	**653**			**7,600**	**146**	**146**			**71,473**
Miami	Miami	Maine	Portland	4	25%	20	50	1	1.0	190	205	395
Canaveral	Orlando	Maine	Portland	4	25%	20	50	1	1.0	190	205	395
Canaveral	Tampa	Maine	Portland	3	25%	20	38	0.7	0.7	190	205	277
Canaveral	Jacksonville	Maine	Portland	4		20	-	0	0.0	190	205	-
Miami	Miami	Boston	New Bedford	59	25%	20	738	14.2	14.2	190	205	5,609
Canaveral	Orlando	Boston	New Bedford	27	25%	20	338	6.5	6.5	190	205	2,568
Canaveral	Tampa	Boston	New Bedford	72	25%	20	900	17.3	17.3	190	205	6,834
Canaveral	Jacksonville	Boston	New Bedford	46		20	-	0	0.0	190	205	-
Miami	Miami	MA Rem/RI/CTRem	New Bedford	7	25%	20	88	1.7	1.7	190	205	672
Canaveral	Orlando	MA Rem/RI/CTRem	New Bedford	14	25%	20	175	3.4	3.4	190	205	1,343
Canaveral	Tampa	MA Rem/RI/CTRem	New Bedford	49	25%	20	613	11.8	11.8	190	205	4,661
Canaveral	Jacksonville	MA Rem/RI/CTRem	New Bedford	1		20	-	0	0.0	190	205	-
			Subtotal	**290**			**2,988**	**58**	**58**			**22,752**
Northbound Total				**1,207**			**13,888**	**267**	**267**			**125,975**

Flow Im-Balances	Disch	Load	Balance		
Portland	7	45	-38	145	
Boston	0	0	0	215	
Del River	0	0	0	145	
Norfolk	73	112	-38	215	
Canaveral	216	133	83	140	
Miami	256	70	185	140	
Total	551	360	191		-

Grand Total **Loads Carried:** **798** **Handling Costs** **378,745**
Handling Cost Per Load **$ 474**

Volume / Week

	Southbound Origin:				Northbound Origin			
Dest:	North	Central	SB Lds by Dest	**Dest:**	South	Central	NB Lds by Dest	Total For Week
North			0	North	58	64	121	
Central	60		60	Central	146		146	
South	83	389	471	South			0	
On/Bd dep:	143	471	531	n/Bd dep:	204	121	267	
	SB1	SB2			NB1	NB2		
Cap Limited Volume:								90% max avg utilization
Sail/Week	2	2			2	2		
Cap/Sail	314	314			314	314		
Cap/Week	628	628			628	628		
Capac Restricted Volume	-	-	-		-	-	-	
Expected On Bd/wk	143	471	531		204	121	267	798
Per Voyage	71	236			102	61		

378,745 Handling Costs Adjusted For Volume

Cap Limited Volume - Ship Type 1								90% max avg utilization
Sail/Week	2	2			2	2		
Cap/Sail	151	151			151	151		
Cap/Week	302	302			302	302		
Capac Restricted Volume	-	(200)	(200)		-	-	-	
Expected On Bd/wk	143	272	332		204	121	267	599
Per Voyage	71	136			102	61		

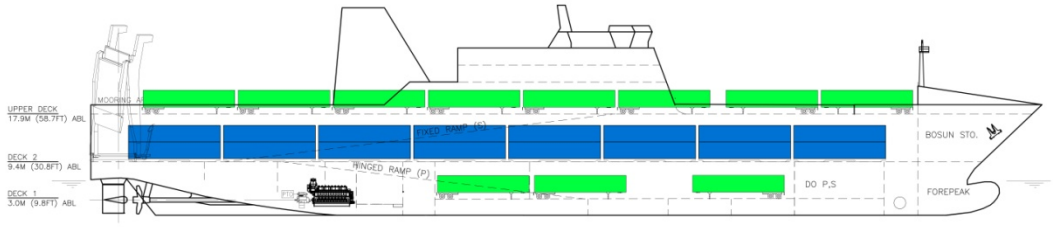
284,047 Handling Costs Adjusted For Volume

Service Recap

Voy Option	Cap - Units Per Voy	Voy Days	Vsl Voy Costs	Vsl Own/Op	Fuel Costs	Port Calls	Avg Speed
a) Opt 11 vsl04 10.5day	314	10.5	1,110.6	578.0	376.1	156.4	16.5
b) Opt 11 vsl01 10.5day	151	10.5	1,005.3	500.2	367.1	137.9	16.5

APPENDIX I: MARAD AMH VESSEL DESIGNS AND CHARACTERISTICS

01 - AMH RoRo Small 18kt



Principal Particulars

MAIN DIMENSIONS		
Length, Over All	167.7 m	550.2 ft
Length, Between Perp.	150.2 m	492.8 ft
Beam	27 m	88.6 ft
Depth	17.9 m	58.7 ft
Design Draft	6.0 m	19.7 ft
Dwt. at Design Draft	5,442 MT	
Cb at Design Draft	0.57	

HULL PROPORTIONS	
L/B	5.6
B/T	4.5
B/D	1.5
L/D	8.4

CARGO	Wt/Unit	Full Load Quantity	Full Load Weight
53' Containers	22	80	1,760
53' Trailers	20	71	1,420
Cassettes	3.56	40	142
Total ‡		423 TEU	3,322 MT
Reefer Outlets	40		

FULL LOAD CONDITION	
Cargo Weight	3,322 MT
Consumables (98%)	1,480 MT
Ballast	520 MT
Constant	120 MT
Lightship	8,710 MT
Displacement	14,152 MT
Estimated GM	2.3 m

PROPULSION	
Suggested Engine	2xMAN 9L32/44CR 2xWartsila 12V34DF
Speed at design draft	18 knots
Operating Power	8,400 kW *
MCR w/ PTO	10,080 kW
RPM	760

RANGE & CONSUMPTION	
M/E Fuel Consumption†	40.3 MT/Day
M/E & D/G Fuel (no reefers)	43.9 MT/Day
Range (MGO)	~10,000 nm
Range (LNG)	4,000 nm

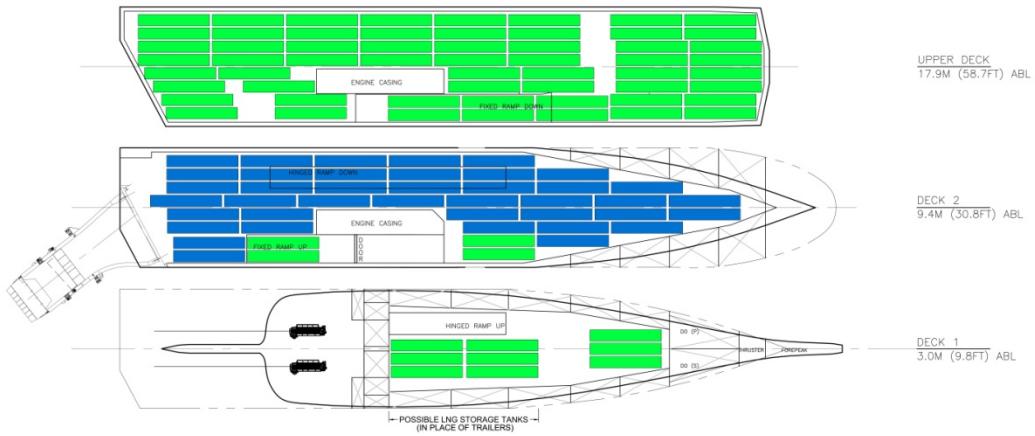
TANK CAPACITIES	
Marine Gas Oil	1,350 m^3
LNG (if provided)	1,000 m^3
Fresh Water	380 m^3
Ballast Water	TBD m^3

Legend:
- 53' Trailer
- 53' Container

Notes:
† Fuel Consumption is based on MGO at the operating power.
LNG propulsion is an option and will require added storage tanks.
‡ Count assumes 2.8TEU/53' Trailer/Container
* Operating power is at design speed and draft with 15% sea margin

HEC Herbert Engineering Corp. DRWN CMB CHKD EVR DATE 05-03-11 FILE 2010-083	U.S. Maritime Administration	AMERICAN MARINE HIGHWAY DESIGN CONCEPT	TYPE Small 18kt CLASS RoRo	2010-083-050-01 Sheet 1 of 2 Rev.-

01 - AMH RoRo Small 18kt

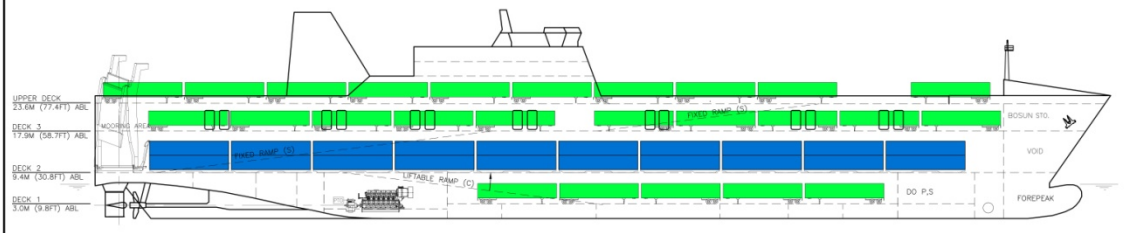


RORO DECKS	HEIGHT OF DECK	HEIGHT TO DECK ABOVE	DEPTH OF STRUCT OF DECK ABOVE	CLEAR HEIGHT FOR VEHICLES		NET AREA		LANE LENGTH		SAMPLE STOW		DECK STRENGTH	
	m	m	m	m	ft	m^2	ft^2	lane-m	lane-ft	# trailers	# containers	t/m^2	PSF
Upper Deck	17.9	open	-	-	-	3,358	36,145	1,120	3,673	58	-	1.5	300
Deck 2	9.4	8.5	1.2	7.3	23.9	2,717	29,245	814	2,669	4	80	2.0	400
Deck 1	3.0	6.4	1.2	5.2	17.1	859	9,246	223	732	9	-	1.5	300
Total						6,934	74,636	2,156	7,074	71	80		

Legend:
- 53' Trailer
- 53' Container

HEC Herbert Engineering Corp. DRWN CMB CHKD EVR DATE 05-27-11 FILE 2010-083	U.S. Maritime Administration	AMERICAN MARINE HIGHWAY DESIGN CONCEPT	TYPE Small 18kt CLASS RoRo	2010-083-050-01 Sheet 2 of 2 Rev.-

03 - AMH RoRo Medium 24kt



Principal Particulars

MAIN DIMENSIONS		
Length, Over All	207.9 m	682.1 ft
Length, Between Perp.	190.4 m	624.7 ft
Beam	28.5 m	93.5 ft
Depth	23.6 m	77.4 ft
Design Draft	7.0 m	23.0 ft
Dwt. at Design Draft	10,178 MT	
Cb at Design Draft	0.63	

HULL PROPORTIONS	
L/B	6.7
B/T	4.1
B/D	1.2
L/D	8.1

CARGO	Wt/Unit	Full Load Quantity	Full Load Weight
53' Containers	22	104	2,288
53' Trailers	20	151	3,020
Cassettes	3.56	52	185
Total ‡		714 TEU	5,493 MT
Reefer Outlets	50		

FULL LOAD CONDITION	
Cargo Weight	5,493 MT
Consumables (98%)	2,675 MT
Ballast	1,890 MT
Constant	120 MT
Lightship	14,447 MT
Displacement	24,625 MT
Estimated GM	1.0 m

PROPULSION	
Suggested Engine	2xMAN 12V51/60DF 2xWartsila 12V50DF
Speed at design draft	23.7 knots
Operating Power	21,600 kW *
MCR	24,000 kW
RPM	514

RANGE & CONSUMPTION	
M/E Fuel Consumption†	102.4 MT/Day
M/E & D/G Fuel (no reefers)	106.4 MT/Day
Range (MGO)	~10,000 nm
Range (LNG)	4,000 nm

TANK CAPACITIES	
Marine Gas Oil	2,700 m^3
LNG (if provided)	2,100 m^3
Fresh Water	380 m^3
Ballast Water	TBD m^3

Legend:
- 53' Trailer
- 53' Container

Notes:
† Fuel Consumption is based on MGO at the operating power.
LNG propulsion is an option and will require added storage tanks.
‡ Count assumes 2.8TEU/53' Trailer/Container
* Operating power is at design speed and draft with 15% sea margin

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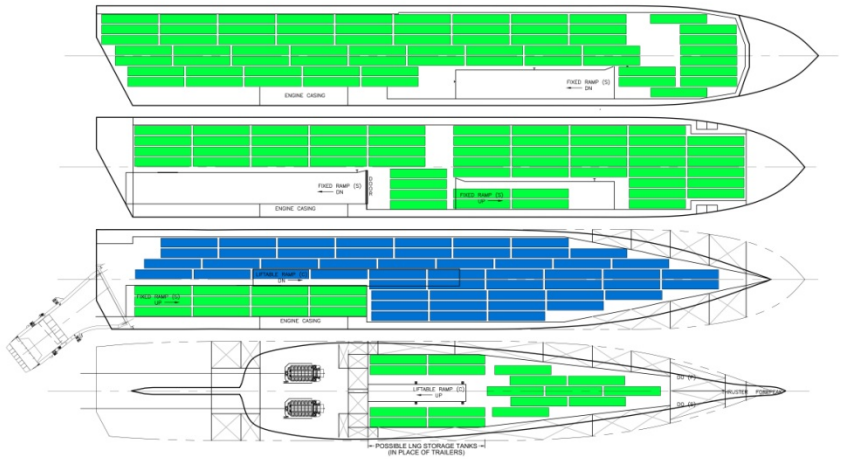
U.S. Maritime Administration

AMERICAN MARINE HIGHWAY DESIGN CONCEPT

TYPE Medium 24kt | CLASS RoRo | 2010-083-050-03 | Sheet 1 of 2 | Rev. -

03 - AMH RoRo Medium 24kt



RORO DECKS	HEIGHT OF DECK	HEIGHT TO DECK ABOVE	DEPTH OF STRUCT OF DECK ABOVE	CLEAR HEIGHT FOR VEHICLES		NET AREA		LANE LENGTH		SAMPLE STOW		DECK STRENGTH	
	m	m	m	m	ft	m^2	ft^2	lane-m	lane-ft	# trailers	# containers	t/m^2	PSF
Upper Deck	23.6	open	-	-	-	3,796	40,859	1,217	3,993	65	-	1.25	250
Deck 3	17.9	5.7	1	4.7	15.4	3,453	37,167	1,058	3,471	57	-	1.5	300
Deck 2	9.4	8.5	1.2	7.3	23.9	3,528	37,974	1,144	3,753	12	104	2.0	400
Deck 1	3	6.4	1.2	5.2	17.1	1,377	14,822	344	1,129	17	-	1.5	300
Total						12,154	130,822	3,763	12,346	151	104		

Legend:
- 53' Trailer
- 53' Container

HEC Herbert Engineering Corp. | DRWN CNC | CHKD EVR | DATE 05-03-11 | FILE 2010-083 | AMH03-DATASHEET-CC7.DWG

U.S. Maritime Administration

AMERICAN MARINE HIGHWAY DESIGN CONCEPT

TYPE Medium 24kt | CLASS RoRo | 2010-083-050-03 | Sheet 2 of 2 | Rev. -

04 - AMH RoRo Medium 20kt SR

Principal Particulars

MAIN DIMENSIONS		
Length, Over All	183.5 m	602.0 ft
Length, Between Perp.	175.0 m	574.1 ft
Beam	29.0 m	95.1 ft
Depth	20.8 m	68.2 ft
Design Draft	7.1 m	23.3 ft
Dwt. at Design Draft	10,601 MT	
Cb at Design Draft	0.63	

HULL PROPORTIONS	
L/B	6.0
B/T	4.1
B/D	1.4
L/D	8.4

CARGO	Wt/Unit	Full Load Quantity	Full Load Weight
53' Containers	22	160	3,520
53' Trailers	20	154	3,080
Cassettes	3.56	80	285
Total ‡		879 TEU	6,885 MT
Reefer Outlets	50		

FULL LOAD CONDITION	
Cargo Weight	6,885 MT
Consumables (98%)	1,750 MT
Ballast	1,866 MT
Constant	100 MT
Lightship	12,729 MT
Displacement	23,330 MT
Estimated GM	1.0 m

PROPULSION	
Suggested Engine	4xMAN 7L32/44CR 4xWartsila 7L32
Speed at design draft	20 knots
Operating Power	13,300 kW *
MCR	15,680 kW
RPM	720

RANGE & CONSUMPTION	
M/E Fuel Consumption†	63.7 MT/Day
M/E & D/G Fuel (no reefers)	67.2 MT/Day
Range (MGO)	~10,000 nm
Range (LNG)	4,000 nm

TANK CAPACITIES	
Marine Gas Oil	1,875 m^3
LNG (if provided)	1,425 m^3
Fresh Water	380 m^3
Ballast Water	TBD m^3

Legend:

53' Trailer
53' Container

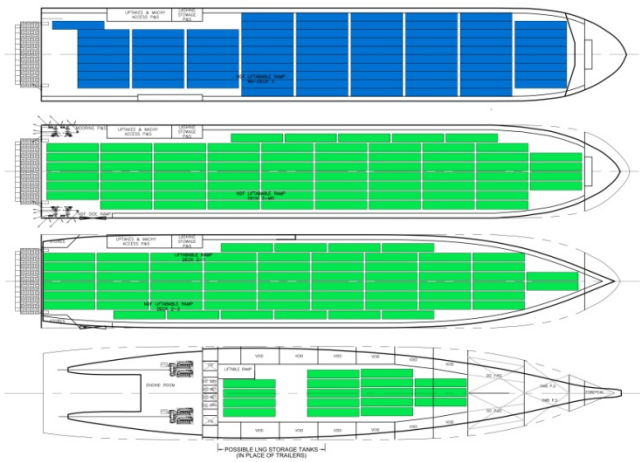
Notes:

† Fuel Consumption is based on MGO at the operating power.
LNG propulsion is an option and will require added storage tanks.
‡ Count assumes 2.8TEU/53' Trailer/Container
* Operating power is at design speed and draft with 15% sea margin

HEC Herbert Engineering Corp.	U.S. Maritime Administration	AMERICAN MARINE HIGHWAY DESIGN CONCEPT	TYPE Medium 20kt SR / CLASS RoRo	2010-083-050-04 Sheet 1 of 2 Rev. -

DRWN CNC DATE 05-03-11 CHKD EVR FILE 2010-083
AMH04-DATASHEET-CC2.DWG

04-AMH RoRo Medium 20kt SR



RORO DECKS	HEIGHT OF DECK	HEIGHT TO DECK ABOVE	DEPTH OF STRUCT OF DECK ABOVE	CLEAR HEIGHT FOR VEHICLES		NET AREA		LANE LENGTH		SAMPLE STOW		DECK STRENGTH	
	m	m	m	m	ft	m^2	ft^2	lane-m	lane-ft	# trailers	# containers	t/m^2	PSF
Upper Deck	20.8	open	-	-	-	4,145	44,616	1,213	3,980	-	160	1.25	250
Deck 3	15.15	5.65	1.2	4.45	14.6	4,100	44,131	1,218	3,996	71	-	1.5	300
Deck 2	9.5	5.65	1.2	4.45	14.6	3,905	42,032	1,124	3,688	66	-	2.0	400
Deck 1	2.0	7.5	1.2	6.3	20.7	1,275	13,724	357	1,171	17	-	1.5	300
Total						13,425	144,503	3,912	12,834	154	160		

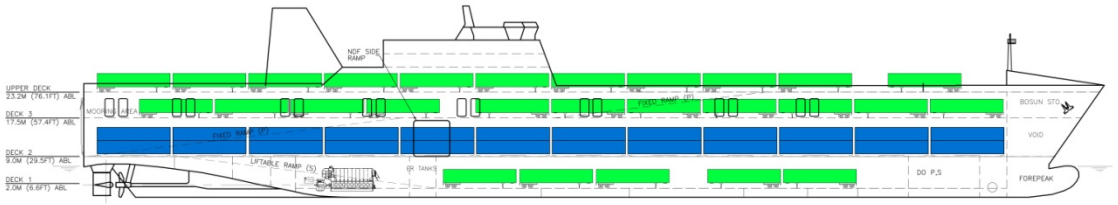
Legend:

53' Trailer
53' Container

HEC Herbert Engineering Corp.	U.S. Maritime Administration	AMERICAN MARINE HIGHWAY DESIGN CONCEPT	TYPE Medium 20kt SR / CLASS RoRo	2010-083-050-04 Sheet 2 of 2 Rev. -

DRWN CNC DATE 05-03-11 CHKD EVR FILE 2010-083
AMH04-DATASHEET-CC2.DWG

05 - AMH RoRo Large 21kt



Principal Particulars

MAIN DIMENSIONS		
Length, Over All	225.7 m	740.5 ft
Length, Between Perp.	208.6 m	684.4 ft
Beam	29.5 m	96.78 ft
Depth	23.2 m	76.11 ft
Design Draft	6.8 m	22.31 ft
Dwt. at Design Draft	10,380 MT	
Cb at Design Draft	0.61	

HULL PROPORTIONS	
L/B	7.1
B/T	4.3
B/D	1.3
L/D	9.0

CARGO	Wt/Unit	Full Load Quantity	Full Load Weight
53' Containers	22	140	3,080
53' Trailers	20	203	4,060
Cassettes	3.56	70	249
Total ‡		960 TEU	7,389 MT
Reefer Outlets	50		

FULL LOAD CONDITION	
Cargo Weight	7,389 MT
Consumables (98%)	2,241 MT
Ballast	650 MT
Constant	100 MT
Lightship	15,654 MT
Displacement	26,034 MT
Estimated GM	1.2 m

PROPULSION	
Suggested Engine	2xMAN 9L51/60DF 2xWartsila 9L50DF
Speed at design draft	21 knots
Operating Power	16,200 kW *
MCR	18,000 kW
RPM	514

RANGE & CONSUMPTION	
M/E Fuel Consumption†	76.8 MT/Day
M/E & D/G Fuel (no reefers)	80.9 MT/Day
Range (MGO)	~10,000 nm
Range (LNG)	4,000 nm

TANK CAPACITIES	
Marine Gas Oil	2,300 m^3
LNG (if provided)	1,725 m^3
Fresh Water	380 m^3
Ballast Water	TBD m^3

Legend:
- 53' Trailer
- 53' Container

Notes:
† Fuel Consumption is based on MGO at the operating power.
LNG propulsion is an option and will require added storage tanks.
‡ Count assumes 2.8TEU/53' Trailer/Container
* Operating power is at design speed and draft with 15% sea margin

HEC Herbert Engineering Corp. | DRWN CNC | CHKD EVR | DATE 05-03-11 | FILE 2010-083

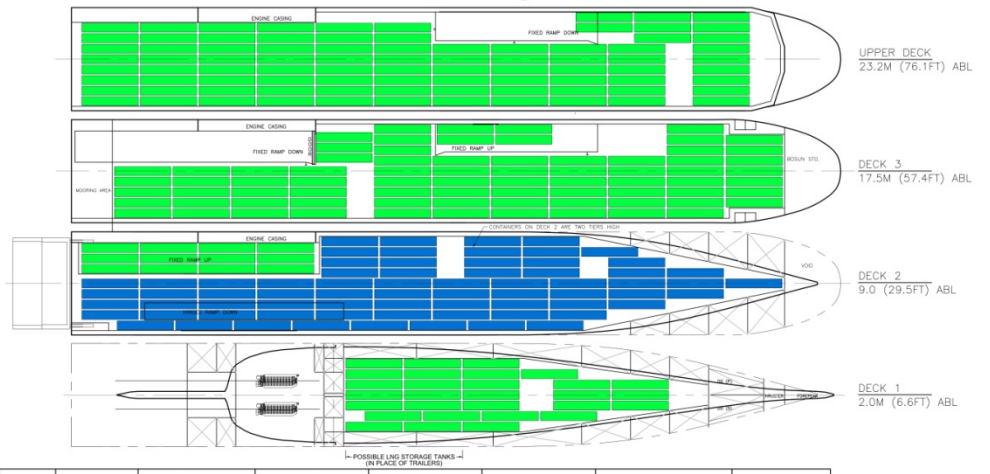
U.S. Maritime Administration

AMERICAN MARINE HIGHWAY DESIGN CONCEPT

TYPE Large 21kt | CLASS RoRo | 2010-083-050-05 | Sheet 1 of 2 | Rev. -

AMH05-DATASHEET-CC2 ENG VIEWS CURRENT.DWG

05 - AMH RoRo Large 21kt



RORO DECKS	HEIGHT OF DECK	HEIGHT TO DECK ABOVE	DEPTH OF STRUCT OF DECK ABOVE	CLEAR HEIGHT FOR VEHICLES		NET AREA		LANE LENGTH		SAMPLE STOW		DECK STRENGTH	
	m	m	m	m	ft	m^2	ft^2	lane-m	lane-ft	# trailers	# containers	t/m^2	PSF
Upper Deck	23.2	open	-	-	-	4,785	51,504	1,558	5,111	86	-	1.25	250
Deck 3	17.5	5.7	1.0	4.7	15.4	4,461	48,017	1,432	4,698	76	-	1.5	300
Deck 2	9.0	8.5	1.2	7.3	23.9	4,402	47,382	1,470	4,823	12	140	2.0	400
Deck 1	2.0	7	1.2	5.8	19.0	1,785	19,213	538	1,765	29	-	1.5	300
Total						15,433	166,116	4,998	16,397	203	140		

Legend:
- 53' Trailer
- 53' Container

HEC Herbert Engineering Corp. | DRWN CNC | CHKD EVR | DATE 05-03-11 | FILE 2010-083

U.S. Maritime Administration

AMERICAN MARINE HIGHWAY DESIGN CONCEPT

TYPE Large 21kt | CLASS RoRo | 2010-083-050-05 | Sheet 2 of 2 | Rev. -

AMH05-DATASHEET-CC2 ENG VIEWS CURRENT.DWG

11 - ATB RoCon 14kt

Principal Particulars

MAIN DIMENSIONS		
Combined Length, Over All	215.7 m	707.7 ft
Barge Length, Between Perp.	199.6 m	654.8 ft
Barge Length, Over All	200.9 m	659.1 ft
Beam	32.2 m	105.6 ft
Depth	13.8 m	45.3 ft
Design Draft	4.3 m	14.1 ft
Dwt. at Design Draft	9,411 MT	
Cb at Design Draft	0.65	

HULL PROPORTIONS	
L/B	6.2
B/T	7.5
B/D	2.3
L/D	14.5

CARGO	Wt/Unit	Full Load Quantity	Full Load Weight	Capacity Quantity
40' Containers	22	376	8,272	346
53' Trailers	20	43	860	74
40' Trailers	20	7	140	7
Cassettes	3.56	39	139	0
Total ‡		886 TEU	9,411 MT	913 TEU
Reefer Outlets	50			

FULL LOAD CONDITION (BARGE)	
Cargo Weight	9,411 MT
Consumables (2900 NM)	0 MT
Ballast	0 MT
Constant	0 MT
Lightship	9,025 MT
Displacement	18,436 MT
Estimated GM	9.7 m

PROPULSION	
Suggested Engine	2xMAN 8L32/44CR 2xWartsila 9L32
Speed at design draft	14 knots
Operating Power	8,100 kW *
MCR	9,000 kW
RPM	720

RANGE & CONSUMPTION	
M/E Fuel Consumption†	38.8 MT/Day
M/E & D/G Fuel (no reefers)	41.8 MT/Day
Range (MGO)	5,700 nm
(Extended range available by storing fuel on barge)	

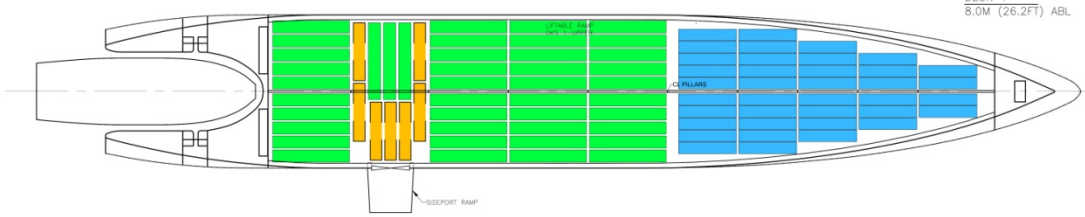
TANK CAPACITIES	
Marine Gas Oil (tug)	970 m^3
Fresh Water	0 m^3
Ballast Water	0 m^3

Legend:
- 53' Trailer
- 40' Trailer
- 40' Container

Notes:
† Fuel Consumption is based on MGO at the operating power.
‡ Count assumes 2.8TEU/53' Trailer/Container and 2.0TEU per 40'/45' Trailer/Container.
* Operating power is at design speed and draft with 15% sea margin

HEC Herbert Engineering Corp.	DRWN CNC DATE 05-27-11 CHKD EVR FILE 2010-083	U.S. Maritime Administration	AMERICAN MARINE HIGHWAY DESIGN CONCEPT	TYPE ATB 14 Kt CLASS RoCon	2010-083-050-11 Sheet 1 of 2 Rev. -

11 - ATB RoCon 14kt

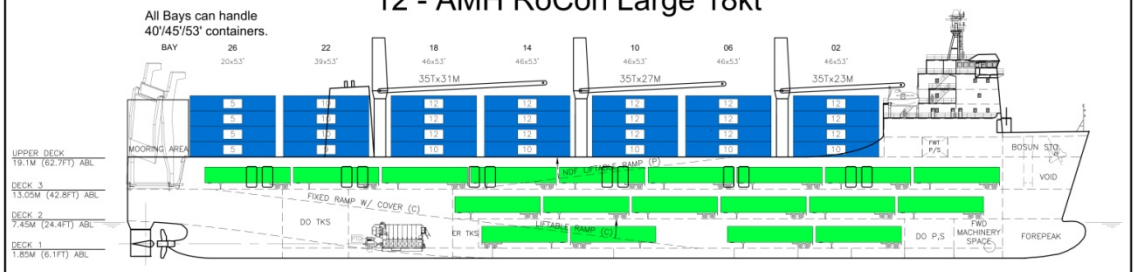


RORO DECKS	HEIGHT OF DECK	HEIGHT TO DECK ABOVE	DEPTH OF STRUCT OF DECK ABOVE	CLEAR HEIGHT FOR VEHICLES		NET AREA		LANE LENGTH		SAMPLE STOW		DECK STRENGTH	
	m	m	m	m	ft	m^2	ft^2	lane-m	lane-ft	# trailers	# containers	t/m^2	PSF
Upper Deck	13.8	open	-	-	-	4,100	44,131	1,300	4,265	0	338	1.5	300
Deck 1	8	5.8	1.2	4.6	15.1	4,045	43,539	1,300	4,265	50	38	1.7	350
Total						8,145	87,670	2,600	8,530	50	376		

Legend:
- 53' Trailer
- 40' Trailer
- 40' Container

HEC Herbert Engineering Corp.	DRWN CNC DATE 05-27-11 CHKD EVR FILE 2010-083	U.S. Maritime Administration	AMERICAN MARINE HIGHWAY DESIGN CONCEPT	TYPE ATB 14 kt CLASS RoCon	2010-083-050-11 Sheet 2 of 2 Rev. -

12 - AMH RoCon Large 18kt



Principal Particulars

MAIN DIMENSIONS		
Length, Over All	181.7 m	596.1 ft
Length, Between Perp.	172.0 m	564.3 ft
Beam	32.2 m	105.6 ft
Depth	18.5 m	60.7 ft
Design Draft	6.8 m	22.4 ft
Dwt. at Design Draft	11,034 MT	
Cb at Design Draft	0.61	

HULL PROPORTIONS	
L/B	5.3
B/T	4.7
B/D	1.7
L/D	9.3

CARGO	Wt/Unit	Full Load Quantity	Full Load Weight
53' Containers	22	289	6,358
53' Trailers	20	125	2,500
Total ‡		1,159 TEU	8,858 MT
Reefer Outlets	50		

FULL LOAD CONDITION	
Cargo Weight	8,858 MT
Consumables (98%)	2,076 MT
Ballast	0 MT
Constant	100 MT
Lightship	12,846 MT
Displacement	23,880 MT
Estimated GM	2.1 m

PROPULSION	
Suggested Engine	2xMAN 7L51/60DF
	2xWartsila 7L50DF
Speed at design draft	18.3 knots
Operating Power	12,600 kW *
MCR	14,000 kW
RPM	514

RANGE & CONSUMPTION	
M/E Fuel Consumption†	59.7 MT/Day
M/E & D/G Fuel (no reefers)	63.4 MT/Day
Range (MGO)	~10,000 nm
Range (LNG)	4,000 nm

TANK CAPACITIES	
Marine Gas Oil	2,100 m^3
LNG (if provided)	1,300 m^3
Fresh Water	380 m^3
Ballast Water	TBD m^3

Legend:
- 53' Trailer
- 53' Container

Notes:
† Fuel Consumption is based on MGO at the operating power.
LNG propulsion is an option and will require added storage tanks.
‡ Count assumes 2.8TEU/53' Trailer/Container
* Operating power is at design speed and draft with 15% sea margin

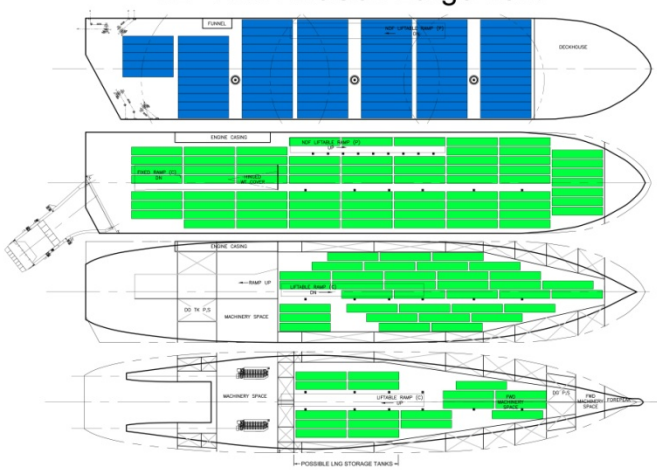
HEC Herbert Engineering Corp. | DRWN CNC | CHKD EVR | DATE 05-27-11 | FILE 2010-083 | AMH12-DATASHEET-CC2.DWG

U.S. Maritime Administration

AMERICAN MARINE HIGHWAY DESIGN CONCEPT

TYPE Large 18kt | CLASS RoCon | 2010-083-050-12 | Sheet 1 of 2 | Rev. -

12 - AMH RoCon Large 18kt



RORO DECKS	HEIGHT OF DECK	HEIGHT TO DECK ABOVE	DEPTH OF STRUCT OF DECK ABOVE	CLEAR HEIGHT FOR VEHICLES		NET AREA		LANE LENGTH		SAMPLE STOW		DECK STRENGTH	
	m	m	m	m	ft	m^2	ft^2	lane-m	lane-ft	# trailers	# containers	t/m^2	PSF
Upper Deck	19.1	open	-	-	-	3,452	37,156	1,148	3,766	-	289	1.5	300
Deck 3	13.05	6.05	1.3	4.75	15.6	4,650	50,051	1,389	4,557	72	-	1.7	350
Deck 2	7.45	5.6	1.1	4.5	14.8	2,312	24,886	616	2,021	35	-	1.25	250
Deck 1	1.85	5.6	1.1	4.5	14.8	1,520	16,361	379	1,243	18	-	1.25	250
Total						11,934	128,454	3,532	11,588	125	289		

Legend:
- 53' Trailer
- 53' Container

HEC Herbert Engineering Corp. | DRWN CNC | CHKD EVR | DATE 05-27-11 | FILE 2010-083 | AMH12-DATASHEET-CC2.DWG

U.S. Maritime Administration

AMERICAN MARINE HIGHWAY DESIGN CONCEPT

TYPE Large 18kt | CLASS RoCon | 2010-083-050-12 | Sheet 2 of 2 | Rev. -

13 - AMH RoCon Large 22kt

Principal Particulars

MAIN DIMENSIONS		
Length, Over All	201.3 m	660.4 ft
Length, Between Perp.	187.0 m	613.5 ft
Beam	32.2 m	105.6 ft
Depth	18.6 m	61.0 ft
Design Draft	7.6 m	24.9 ft
Dwt. at Design Draft	14,994 MT	
Cb at Design Draft	0.61	

HULL PROPORTIONS	
L/B	5.8
B/T	4.2
B/D	1.7
L/D	10.1

CARGO	Wt/Unit	Full Load Quantity	Full Load Weight	Capacity Quantity
53' Containers	22	256	5,632	304
40' Containers	22	107	2,354	133
53' Trailers	20	94	1,880	94
40' Trailers	20	7	140	7
Total ‡		1,208 TEU	10,006 MT	1,394 TEU
Reefer Outlets	100			

FULL LOAD CONDITION	
Cargo Weight	10,006 MT
Consumables (98%)	2,619 MT
Ballast	2,269 MT
Constant	100 MT
Lightship	13,478 MT
Displacement	28,472 MT
Estimated GM	2.1 m

PROPULSION	
Suggested Engine	MAN 8L60ME-C8 Wartsilla 8RT-flex60C
Speed at design draft	22 knots
Operating Power	16,848 kW *
MCR	18,720 kW
RPM	abt. 120

RANGE & CONSUMPTION	
M/E Fuel Consumption†	71.1 MT/Day
M/E & D/G Fuel (no reefers)	75.7 MT/Day
Range (MGO)	~12,000 nm

TANK CAPACITIES	
Diesel Oil	2,450 m^3
Fresh Water	380 m^3
Ballast Water	TBD m^3

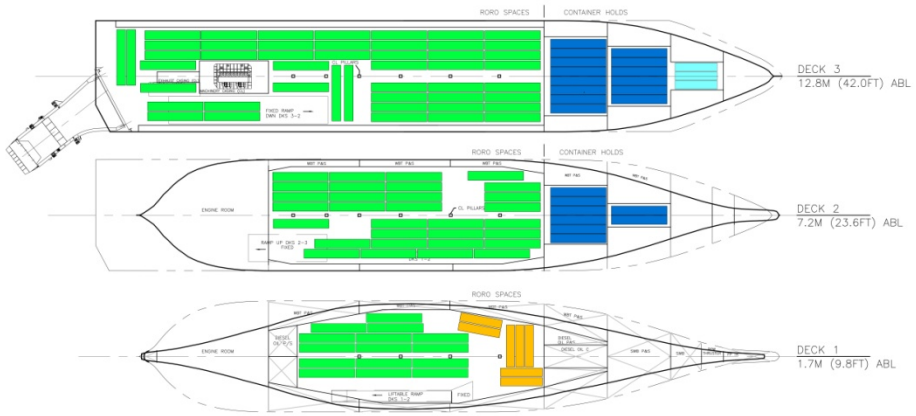
Legend:
53' Trailer | 53' Container
40' Trailer | 40' Container

Notes:
† Fuel Consumption is based on MGO at the operating power.
‡ Count assumes 2.8TEU/53' Trailer/Container and 2.0TEU per 40' Trailer/Container
* Operating power is at design speed and draft with 15% sea margin

HEC Herbert Engineering Corp. DRWN CNC DATE 05-03-11 CHKD EVR FILE 2010-083	U.S. Maritime Administration	AMERICAN MARINE HIGHWAY DESIGN CONCEPT	TYPE Large 22kt CLASS RoCon	2010-083-050-13 Sheet 1 of 2 Rev. -

AMH13-DATASHEET-CC1.DWG

13 - AMH RoCon Large 22kt



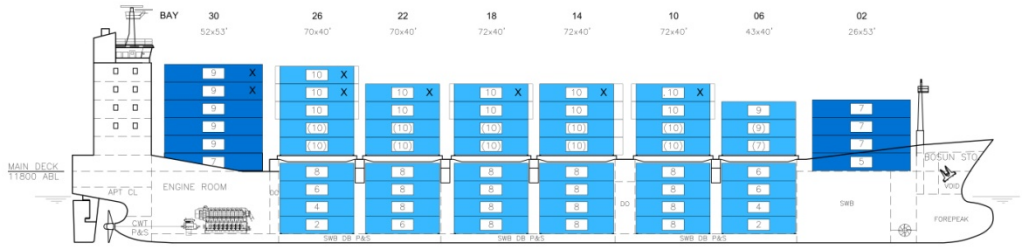
RORO DECKS	HEIGHT OF DECK	HEIGHT TO DECK ABOVE	DEPTH OF STRUCT OF DECK ABOVE	CLEAR HEIGHT FOR VEHICLES		NET AREA		LANE LENGTH		SAMPLE STOW		DECK STRENGTH	
	m	m	m	m	ft	m^2	ft^2	lane-m	lane-ft	# trailers	# containers	t/m^2	PSF
Upper Deck	18.6	open	-	-	-	3,220	34,659	1,000	3,281	-	300	1.5	300
Deck 3	12.80	5.8	1.2	4.6	15.1	3,363	36,198	863	2,831	48	-	1.7	350
Deck 2	7.2	5.6	1.0	4.6	15.1	2,083	22,421	632	2,073	31	-	1.5	300
Deck 1	1.7	5.5	1.0	4.5	14.8	1,567	16,867	447	1,467	22	-	1.5	300
In Hold										-	63		
Total						10,233	110,145	2,942	9,652	101	363		

Legend:
53' Trailer | 53' Container
40' Trailer | 40' Container

HEC Herbert Engineering Corp. DRWN CNC DATE 05-03-11 CHKD EVR FILE 2010-083	U.S. Maritime Administration	AMERICAN MARINE HIGHWAY DESIGN CONCEPT	TYPE Large 22kt CLASS RoCon	2010-083-050-13 Sheet 2 of 2 Rev. -

AMH13-DATASHEET-CC1.DWG

21 - AMH Container Medium 18kt LoLo



Principal Particulars

MAIN DIMENSIONS		
Length, Over All	151.7 m	497.7 ft
Length, Between Perp.	142.4 m	467.2 ft
Beam	24.8 m	81.4 ft
Depth	11.8 m	38.7 ft
Design Draft	7.6 m	24.9 ft
Dwt. at Design Draft	11,866 MT	
Cb at Design Draft	0.63	

HULL PROPORTIONS	
L/B	5.7
B/T	3.3
B/D	2.1
L/D	12.1

CARGO	Wt/Unit	Full Load Quantity	Full Load Weight	Capacity Quantity
53' Containers	22	53	1,166	78
40' Containers	22	339	7,458	399
Total ‡		826 TEU	8,624 MT	1,016 TEU
Reefer Outlets	100			

FULL LOAD CONDITION	
Cargo Weight	8,624 MT
Consumables (98%)	1,586 MT
Ballast	1,556 MT
Constant	100 MT
Lightship	5,530 MT
Displacement	17,396 MT
Estimated GM	0.8 m

PROPULSION	
Suggested Engine	MAN 8L48/60CR Wartsila 8L46F
Speed at design draft	18 knots
Operating Power	8,100 kW *
MCR	9,600 kW
RPM	514

RANGE & CONSUMPTION	
M/E Fuel Consumption†	36.7 MT/Day
M/E & D/G Fuel (no reefers)	38.8 MT/Day
Range (MGO)	11,500 nm

TANK CAPACITIES	
Marine Gas Oil	1,450 m^3
Fresh Water	380 m^3
Ballast Water	TBD m^3

Legend:

40' Container
53' Container

Notes:

† Fuel Consumption is based on MGO at the operating power.
‡ Count assumes 2.8TEU/53' Container and 2.0TEU per 40' Container
* Operating power is at design speed and draft with 15% sea margin

HEC Herbert Engineering Corp. | DRWN CMB | CHKD EVR | DATE 05-03-11 | FILE 2010-083

U.S. Maritime Administration

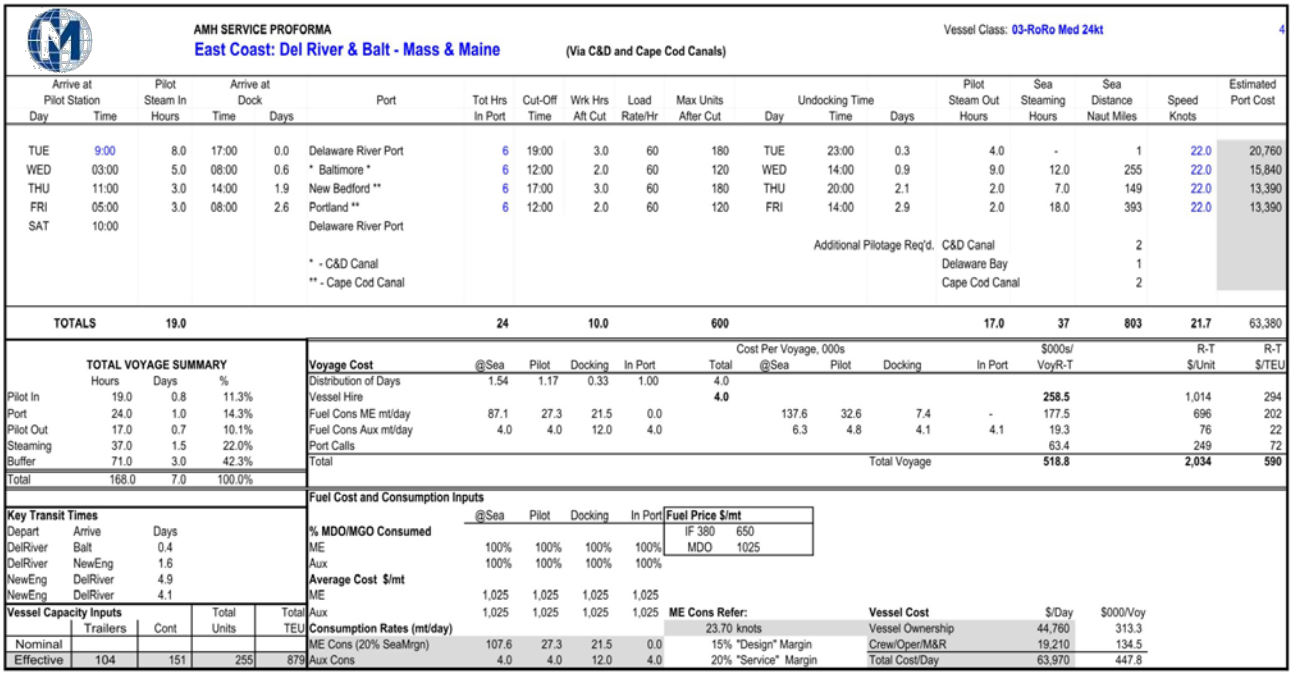
AMERICAN MARINE HIGHWAY
DESIGN CONCEPT

TYPE Medium 18kt LoLo | CLASS Container | 2010-083-050-21 | Sheet 1 of 1 | Rev. -

AMH21-CONTAINERFEEDER18KT06-09-11REV.DWG

APPENDIX J: AMH SERVICE PROFORMAS

Option 1



AMH SERVICE PROFORMA — Vessel Class: **03-RoRo Med 24kt** — 4

East Coast: Del River & Balt - Mass & Maine (Via C&D and Cape Cod Canals)

Arrive at Pilot Station Day	Time	Pilot Steam In Hours	Arrive at Dock Time	Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Time	Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
TUE	9:00	8.0	17:00	0.0	Delaware River Port	6	19:00	3.0	60	180	TUE	23:00	0.3	4.0	-	1	22.0	20,760
WED	03:00	5.0	08:00	0.6	* Baltimore *	6	12:00	2.0	60	120	WED	14:00	0.9	9.0	12.0	255	22.0	15,840
THU	11:00	3.0	14:00	1.9	New Bedford **	6	17:00	3.0	60	180	THU	20:00	2.1	2.0	7.0	149	22.0	13,390
FRI	05:00	3.0	08:00	2.6	Portland **	6	12:00	2.0	60	120	FRI	14:00	2.9	2.0	18.0	393	22.0	13,390
SAT	10:00				Delaware River Port													
												Additional Pilotage Req'd.		C&D Canal		2		
					* - C&D Canal									Delaware Bay		1		
					** - Cape Cod Canal									Cape Cod Canal		2		
TOTALS		**19.0**				**24**		**10.0**		**600**				**17.0**	**37**	**803**	**21.7**	63,380

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	19.0	0.8	11.3%
Port	24.0	1.0	14.3%
Pilot Out	17.0	0.7	10.1%
Steaming	37.0	1.5	22.0%
Buffer	71.0	3.0	42.3%
Total	168.0	7.0	100.0%

Voyage Cost	Cost Per Voyage, 000s @Sea	Pilot	Docking	In Port	Total	$000s/ @Sea	Pilot	Docking	In Port	VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	1.54	1.17	0.33	1.00	4.0							
Vessel Hire					**4.0**					**258.5**	1,014	294
Fuel Cons ME mt/day	87.1	27.3	21.5	0.0		137.6	32.6	7.4	-	177.5	696	202
Fuel Cons Aux mt/day	4.0	4.0	12.0	4.0		6.3	4.8	4.1	4.1	19.3	76	22
Port Calls										63.4	249	72
Total								Total Voyage		**518.8**	**2,034**	**590**

Key Transit Times

Depart	Arrive	Days
DelRiver	Balt	0.4
DelRiver	NewEng	1.6
NewEng	DelRiver	4.9
NewEng	DelRiver	4.1

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	104	151	255	879

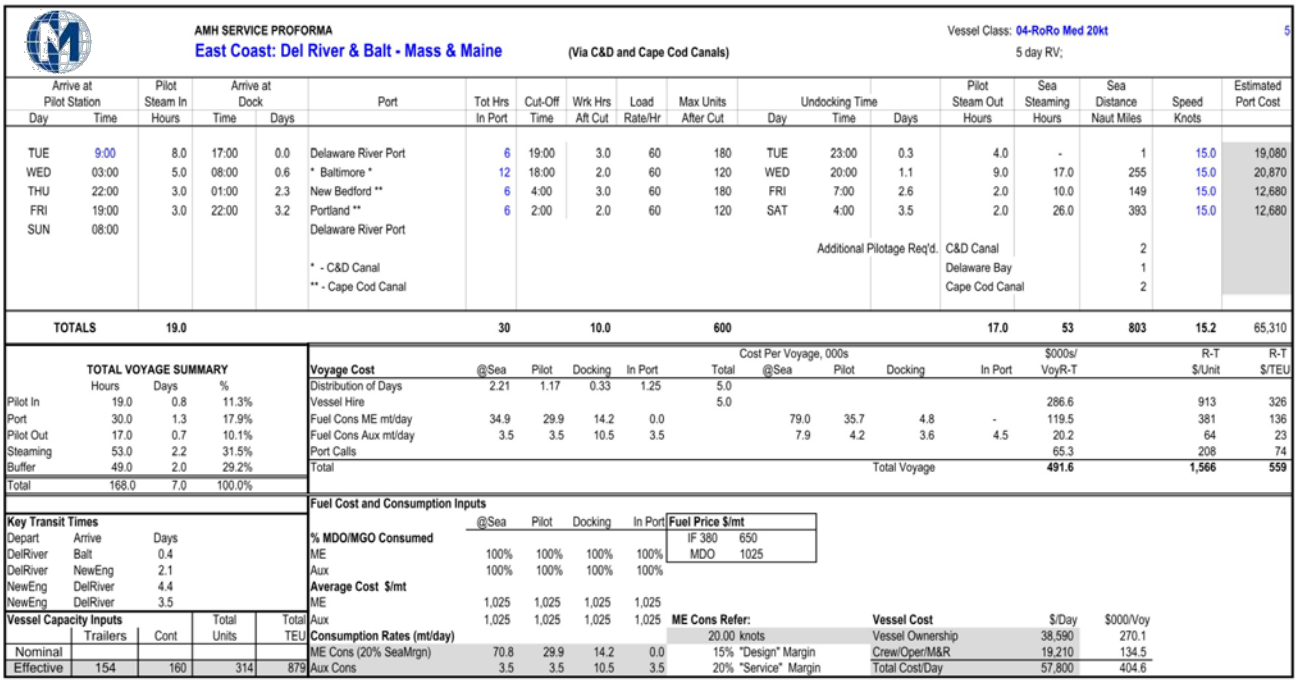
Fuel Cost and Consumption Inputs

	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025
Consumption Rates (mt/day)				
ME Cons (20% SeaMrgn)	107.6	27.3	21.5	0.0
Aux Cons	4.0	4.0	12.0	4.0

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer: 23.70 knots; 15% "Design" Margin; 20% "Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	44,760	313.3
Crew/Oper/M&R	19,210	134.5
Total Cost/Day	63,970	447.8



AMH SERVICE PROFORMA — Vessel Class: **04-RoRo Med 20kt** — 5

East Coast: Del River & Balt - Mass & Maine (Via C&D and Cape Cod Canals) — 5 day RV;

Arrive at Pilot Station Day	Time	Pilot Steam In Hours	Arrive at Dock Time	Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Time	Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
TUE	9:00	8.0	17:00	0.0	Delaware River Port	6	19:00	3.0	60	180	TUE	23:00	0.3	4.0	-	1	15.0	19,080
WED	03:00	5.0	08:00	0.6	* Baltimore *	12	18:00	2.0	60	120	WED	20:00	1.1	9.0	17.0	255	15.0	20,870
THU	22:00	3.0	01:00	2.3	New Bedford **	6	4:00	3.0	60	180	FRI	7:00	2.6	2.0	10.0	149	15.0	12,680
FRI	19:00	3.0	22:00	3.2	Portland **	6	2:00	2.0	60	120	SAT	4:00	3.5	2.0	26.0	393	15.0	12,680
SUN	08:00				Delaware River Port													
												Additional Pilotage Req'd.		C&D Canal		2		
					* - C&D Canal									Delaware Bay		1		
					** - Cape Cod Canal									Cape Cod Canal		2		
TOTALS		**19.0**				**30**		**10.0**		**600**				**17.0**	**53**	**803**	**15.2**	65,310

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	19.0	0.8	11.3%
Port	30.0	1.3	17.9%
Pilot Out	17.0	0.7	10.1%
Steaming	53.0	2.2	31.5%
Buffer	49.0	2.0	29.2%
Total	168.0	7.0	100.0%

Voyage Cost	Cost Per Voyage, 000s @Sea	Pilot	Docking	In Port	Total	$000s/ @Sea	Pilot	Docking	In Port	VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	2.21	1.17	0.33	1.25	5.0							
Vessel Hire					5.0					286.6	913	326
Fuel Cons ME mt/day	34.9	29.9	14.2	0.0		79.0	35.7	4.8	-	119.5	381	136
Fuel Cons Aux mt/day	3.5	3.5	10.5	3.5		7.9	4.2	3.6	4.5	20.2	64	23
Port Calls										65.3	208	74
Total								Total Voyage		**491.6**	**1,566**	**559**

Key Transit Times

Depart	Arrive	Days
DelRiver	Balt	0.4
DelRiver	NewEng	2.1
NewEng	DelRiver	4.4
NewEng	DelRiver	3.5

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	154	160	314	879

Fuel Cost and Consumption Inputs

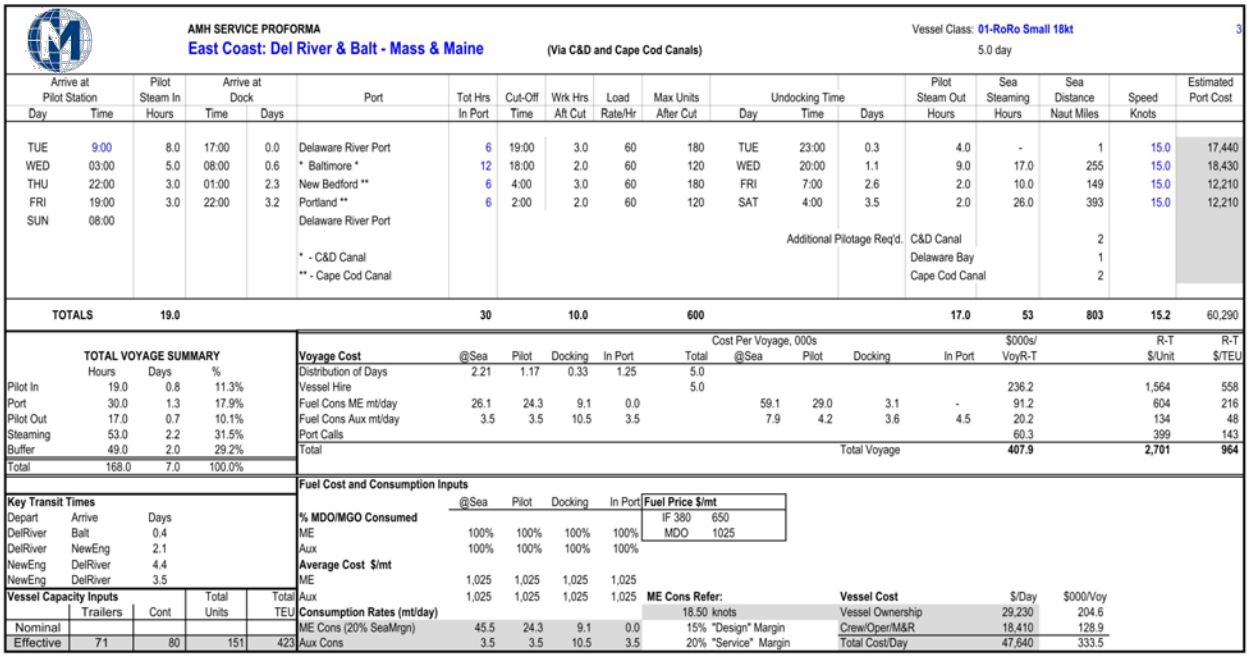
	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025
Consumption Rates (mt/day)				
ME Cons (20% SeaMrgn)	70.8	29.9	14.2	0.0
Aux Cons	3.5	3.5	10.5	3.5

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer: 20.00 knots; 15% "Design" Margin; 20% "Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	38,590	270.1
Crew/Oper/M&R	19,210	134.5
Total Cost/Day	57,800	404.6

Option 1 (cont'd)



AMH SERVICE PROFORMA

East Coast: Del River & Balt - Mass & Maine (Via C&D and Cape Cod Canals)

Vessel Class: **01-RoRo Small 18kt** 3

5.0 day

Arrive at Pilot Station Day	Time	Pilot Steam In Hours	Arrive at Dock Time	Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Time	Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
TUE	9:00	8.0	17:00	0.0	Delaware River Port	6	19:00	3.0	60	180	TUE	23:00	0.3	4.0	-	1	15.0	17,440
WED	03:00	5.0	08:00	0.6	* Baltimore *	12	18:00	2.0	60	120	WED	20:00	1.1	9.0	17.0	255	15.0	18,430
THU	22:00	3.0	01:00	2.3	New Bedford **	6	4:00	3.0	60	180	FRI	7:00	2.6	2.0	10.0	149	15.0	12,210
FRI	19:00	3.0	22:00	3.2	Portland **	6	2:00	2.0	60	120	SAT	4:00	3.5	2.0	26.0	393	15.0	12,210
SUN	08:00				Delaware River Port													
												Additional Pilotage Req'd.		C&D Canal		2		
					* - C&D Canal									Delaware Bay		1		
					** - Cape Cod Canal									Cape Cod Canal		2		
TOTALS		**19.0**				**30**		**10.0**		**600**				**17.0**	**53**	**803**	**15.2**	60,290

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	19.0	0.8	11.3%
Port	30.0	1.3	17.9%
Pilot Out	17.0	0.7	10.1%
Steaming	53.0	2.2	31.5%
Buffer	49.0	2.0	29.2%
Total	168.0	7.0	100.0%

Voyage Cost	Cost Per Voyage, 000s @Sea	Pilot	Docking	In Port	Total	$000s/ @Sea	Pilot	Docking	In Port	VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	2.21	1.17	0.33	1.25	5.0							
Vessel Hire					5.0					236.2	1,564	558
Fuel Cons ME mt/day	26.1	24.3	9.1	0.0		59.1	29.0	3.1	-	91.2	604	216
Fuel Cons Aux mt/day	3.5	3.5	10.5	3.5		7.9	4.2	3.6	4.5	20.2	134	48
Port Calls										60.3	399	143
Total								Total Voyage		**407.9**	**2,701**	**964**

Key Transit Times

Depart	Arrive	Days
DelRiver	Balt	0.4
DelRiver	NewEng	2.1
NewEng	DelRiver	4.4
NewEng	DelRiver	3.5

Fuel Cost and Consumption Inputs

	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025
Consumption Rates (mt/day)				
ME Cons (20% SeaMrgn)	45.5	24.3	9.1	0.0
Aux Cons	3.5	3.5	10.5	3.5

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer: 18.50 knots

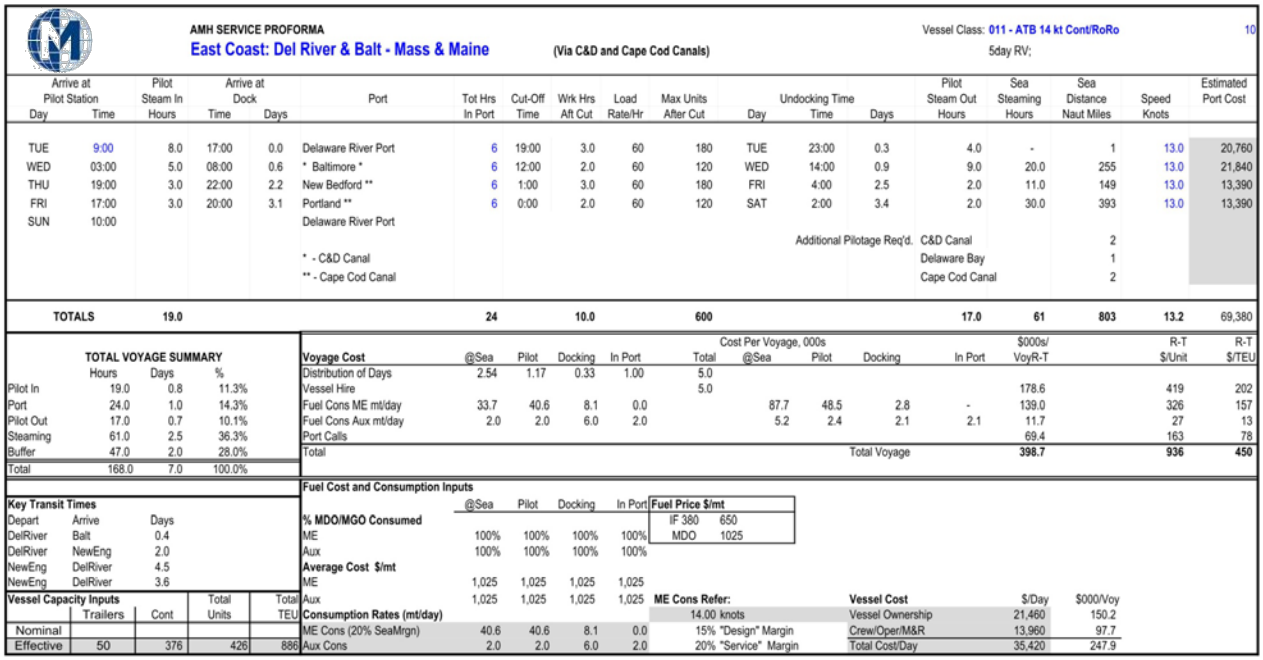
15% "Design" Margin

20% "Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	29,230	204.6
Crew/Oper/M&R	18,410	128.9
Total Cost/Day	47,640	333.5

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	71	80	151	423



AMH SERVICE PROFORMA

East Coast: Del River & Balt - Mass & Maine (Via C&D and Cape Cod Canals)

Vessel Class: **011 - ATB 14 kt Cont/RoRo** 10

5day RV;

Arrive at Pilot Station Day	Time	Pilot Steam In Hours	Arrive at Dock Time	Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Time	Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
TUE	9:00	8.0	17:00	0.0	Delaware River Port	6	19:00	3.0	60	180	TUE	23:00	0.3	4.0	-	1	13.0	20,760
WED	03:00	5.0	08:00	0.6	* Baltimore *	6	12:00	2.0	60	120	WED	14:00	0.9	9.0	20.0	255	13.0	21,840
THU	19:00	3.0	22:00	2.2	New Bedford **	6	1:00	3.0	60	180	FRI	4:00	2.5	2.0	11.0	149	13.0	13,390
FRI	17:00	3.0	20:00	3.1	Portland **	6	0:00	2.0	60	120	SAT	2:00	3.4	2.0	30.0	393	13.0	13,390
SUN	10:00				Delaware River Port													
												Additional Pilotage Req'd.		C&D Canal		2		
					* - C&D Canal									Delaware Bay		1		
					** - Cape Cod Canal									Cape Cod Canal		2		
TOTALS		**19.0**				**24**		**10.0**		**600**				**17.0**	**61**	**803**	**13.2**	69,380

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	19.0	0.8	11.3%
Port	24.0	1.0	14.3%
Pilot Out	17.0	0.7	10.1%
Steaming	61.0	2.5	36.3%
Buffer	47.0	2.0	28.0%
Total	168.0	7.0	100.0%

Voyage Cost	Cost Per Voyage, 000s @Sea	Pilot	Docking	In Port	Total	$000s/ @Sea	Pilot	Docking	In Port	VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	2.54	1.17	0.33	1.00	5.0							
Vessel Hire					5.0					178.6	419	202
Fuel Cons ME mt/day	33.7	40.6	8.1	0.0		87.7	48.5	2.8	-	139.0	326	157
Fuel Cons Aux mt/day	2.0	2.0	6.0	2.0		5.2	2.4	2.1	2.1	11.7	27	13
Port Calls										69.4	163	78
Total								Total Voyage		**398.7**	**936**	**450**

Key Transit Times

Depart	Arrive	Days
DelRiver	Balt	0.4
DelRiver	NewEng	2.0
NewEng	DelRiver	4.5
NewEng	DelRiver	3.6

Fuel Cost and Consumption Inputs

	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025
Consumption Rates (mt/day)				
ME Cons (20% SeaMrgn)	40.6	40.6	8.1	0.0
Aux Cons	2.0	2.0	6.0	2.0

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer: 14.00 knots

15% "Design" Margin

20% "Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	21,460	150.2
Crew/Oper/M&R	13,960	97.7
Total Cost/Day	35,420	247.9

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	50	376	426	886

Option 2

AMH SERVICE PROFORMA — Vessel Class: **04-RoRo Med 20kt**

East Coast: New York/New Jersey - South Florida - Canaveral - New York/New Jersey

Arrive at Pilot Station Day	Arrive at Pilot Station Time	Pilot Steam In Hours	Arrive at Dock Time	Arrive at Dock Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Undocking Time Time	Undocking Time Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
FRI	3:00	3.0	06:00	0.0	New York / New Jersey	14	17:00	3.0	50	150	FRI	20:00	0.6	3.0	54.0	971	18.0	21,280
MON	05:00	2.0	07:00	3.0	Miami	13	17:00	3.0	50	150	MON	20:00	3.6	2.0	13.0	175	14.0	24,540
TUE	11:00	2.0	13:00	4.3	Port Canaveral	7	17:00	3.0	50	150	TUE	20:00	4.6	2.0	53.0	840	16.0	23,840
FRI	03:00		03:00	6.9	New York / New Jersey													
TOTALS		**7.0**				**34**		**9.0**		**450**				**7.0**	**120**	**1,986**	**16.6**	69,660

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	7.0	0.3	4.2%
Port	34.0	1.4	20.2%
Pilot Out	7.0	0.3	4.2%
Steaming	120.0	5.0	71.4%
Buffer	-	0.0	0.0%
Total	168.0	7.0	100.0%

Voyage Cost	@Sea	Pilot	Docking	In Port	Total	Cost Per Voyage, 000s @Sea	Pilot	Docking	In Port	$000s/ VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	5.00	0.33	0.25	1.42	7.0							
Vessel Hire					7.0					404.6	1,289	460
Fuel Cons ME mt/day	45.4	29.9	14.2	0.0		232.7	10.2	3.6	-	246.5	785	280
Fuel Cons Aux mt/day	3.5	3.5	10.5	3.5		17.9	1.2	2.7	5.1	26.9	86	31
Port Calls										69.7	222	79
Total								Total Voyage		**747.7**	**2,381**	**851**

Key Transit Times

Depart	Arrive	Days
NYNJ	SoFlor	2.5
NYNJ	Canav	3.7
Canav	NYNJ	2.4
NYNJ	NYNJ	7.0

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	154	160	314	879

Fuel Cost and Consumption Inputs

	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025
Consumption Rates (mt/day)				
ME Cons (20% SeaMrgn)	70.8	29.9	14.2	0.0
Aux Cons	3.5	3.5	10.5	3.5

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer: 20.00 knots

15% "Design" Margin

20% "Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	38,590	270.1
Crew/Oper/M&R	19,210	134.5
Total Cost/Day	57,800	404.6

AMH SERVICE PROFORMA — Vessel Class: **01-RoRo Small 18kt**

East Coast: New York/New Jersey - South Florida - Canaveral - New York/New Jersey

Arrive at Pilot Station Day	Arrive at Pilot Station Time	Pilot Steam In Hours	Arrive at Dock Time	Arrive at Dock Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Undocking Time Time	Undocking Time Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
FRI	3:00	3.0	06:00	0.0	New York / New Jersey	14	17:00	3.0	50	150	FRI	20:00	0.6	3.0	54.0	971	18.0	21,280
MON	05:00	2.0	07:00	3.0	Miami	13	17:00	3.0	50	150	MON	20:00	3.6	2.0	13.0	175	14.0	24,540
TUE	11:00	2.0	13:00	4.3	Port Canaveral	7	17:00	3.0	50	150	TUE	20:00	4.6	2.0	53.0	840	16.0	23,840
FRI	03:00		03:00	6.9	New York / New Jersey													
TOTALS		**7.0**				**34**		**9.0**		**450**				**7.0**	**120**	**1,986**	**16.6**	69,660

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	7.0	0.3	4.2%
Port	34.0	1.4	20.2%
Pilot Out	7.0	0.3	4.2%
Steaming	120.0	5.0	71.4%
Buffer	-	0.0	0.0%
Total	168.0	7.0	100.0%

Voyage Cost	@Sea	Pilot	Docking	In Port	Total	Cost Per Voyage, 000s @Sea	Pilot	Docking	In Port	$000s/ VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	5.00	0.33	0.25	1.42	7.0							
Vessel Hire					7.0					333.5	2,208	788
Fuel Cons ME mt/day	35.0	24.3	9.1	0.0		179.1	8.3	2.3	-	189.8	1,257	449
Fuel Cons Aux mt/day	3.5	3.5	10.5	3.5		17.9	1.2	2.7	5.1	26.9	178	64
Port Calls										69.7	461	165
Total								Total Voyage		**619.8**	**4,105**	**1,465**

Key Transit Times

Depart	Arrive	Days
NYNJ	SoFlor	2.5
NYNJ	Canav	3.7
Canav	NYNJ	2.4
NYNJ	NYNJ	7.0

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	71	80	151	423

Fuel Cost and Consumption Inputs

	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025
Consumption Rates (mt/day)				
ME Cons (20% SeaMrgn)	45.5	24.3	9.1	0.0
Aux Cons	3.5	3.5	10.5	3.5

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer: 18.50 knots

15% "Design" Margin

20% "Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	29,230	204.6
Crew/Oper/M&R	18,410	128.9
Total Cost/Day	47,640	333.5

Option 2 (cont'd)

AMH SERVICE PROFORMA — Vessel Class: 21-Cont Feeder 18 kt — 5

East Coast: New York/New Jersey - South Florida - Canaveral - New York/New Jersey

Arrive at Pilot Station Day	Time	Pilot Steam In Hours	Arrive at Dock Time	Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Time	Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
FRI	4:00	3.0	07:00	0.0	New York / New Jersey	13	17:00	3.0	50	150	FRI	20:00	0.5	3.0	57.0	971	17.0	21,280
MON	08:00	2.0	10:00	3.1	Miami	11	18:00	3.0	50	150	MON	21:00	3.6	2.0	13.0	175	14.0	24,540
TUE	12:00	2.0	14:00	4.3	Port Canaveral	7	18:00	3.0	50	150	TUE	21:00	4.6	2.0	53.0	840	16.0	23,840
FRI	04:00		04:00	6.9	New York / New Jersey													
TOTALS		**7.0**				**31**		**9.0**		**450**				**7.0**	**123**	**1,986**	**16.1**	69,660

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	7.0	0.3	4.2%
Port	31.0	1.3	18.5%
Pilot Out	7.0	0.3	4.2%
Steaming	123.0	5.1	73.2%
Buffer	-	0.0	0.0%
Total	168.0	7.0	100.0%

Cost Per Voyage, 000s

Voyage Cost	@Sea	Pilot	Docking	In Port	Total	@Sea	Pilot	Docking	In Port	$000s/ VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	5.13	0.33	0.25	1.29	7.0							
Vessel Hire					7.0					270.6	690	328
Fuel Cons ME mt/day	32.7	23.9	8.2	0.0		171.7	8.2	2.1	-	181.9	464	220
Fuel Cons Aux mt/day	2.0	2.0	6.0	2.0		10.5	0.7	1.5	2.6	15.4	39	19
Port Calls										69.7	178	84
Total								Total Voyage		**537.5**	**1,371**	**651**

Key Transit Times

Depart	Arrive	Days
NYNJ	SoFlor	2.6
NYNJ	Canav	3.7
Canav	NYNJ	2.4
NYNJ	NYNJ	7.0

Fuel Cost and Consumption Inputs

	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025
Consumption Rates (mt/day)				
ME Cons (20% SeaMrgn)	41.2	23.9	8.2	0.0
Aux Cons	2.0	2.0	6.0	2.0

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer: 18.00 knots; 15% "Design" Margin; 20% "Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	20,110	140.8
Crew/Oper/M&R	18,540	129.8
Total Cost/Day	38,650	270.6

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	0	392	392	826

AMH SERVICE PROFORMA — Vessel Class: 12-Rocon Large 18kt — 5

East Coast: New York/New Jersey - South Florida - Canaveral - New York/New Jersey

Arrive at Pilot Station Day	Time	Pilot Steam In Hours	Arrive at Dock Time	Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Time	Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
FRI	4:00	3.0	07:00	0.0	New York / New Jersey	13	17:00	3.0	50	150	FRI	20:00	0.5	3.0	57.0	971	17.0	21,280
MON	08:00	2.0	10:00	3.1	Miami	11	18:00	3.0	50	150	MON	21:00	3.6	2.0	13.0	175	14.0	24,540
TUE	12:00	2.0	14:00	4.3	Port Canaveral	7	18:00	3.0	50	150	TUE	21:00	4.6	2.0	53.0	840	16.0	23,840
FRI	04:00		04:00	6.9	New York / New Jersey													
TOTALS		**7.0**				**31**		**9.0**		**450**				**7.0**	**123**	**1,986**	**16.1**	69,660

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	7.0	0.3	4.2%
Port	31.0	1.3	18.5%
Pilot Out	7.0	0.3	4.2%
Steaming	123.0	5.1	73.2%
Buffer	-	0.0	0.0%
Total	168.0	7.0	100.0%

Cost Per Voyage, 000s

Voyage Cost	@Sea	Pilot	Docking	In Port	Total	@Sea	Pilot	Docking	In Port	$000s/ VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	5.13	0.33	0.25	1.29	7.0							
Vessel Hire					7.0					409.4	989	353
Fuel Cons ME mt/day	32.7	34.6	12.6	0.0		171.7	11.8	3.2	-	186.7	451	161
Fuel Cons Aux mt/day	3.7	3.7	11.1	3.7		19.4	1.3	2.8	4.9	28.4	69	25
Port Calls										69.7	168	60
Total								Total Voyage		**694.2**	**1,677**	**599**

Key Transit Times

Depart	Arrive	Days
NYNJ	SoFlor	2.6
NYNJ	Canav	3.7
Canav	NYNJ	2.4
NYNJ	NYNJ	7.0

Fuel Cost and Consumption Inputs

	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025
Consumption Rates (mt/day)				
ME Cons (20% SeaMrgn)	62.8	34.6	12.6	0.0
Aux Cons	3.7	3.7	11.1	3.7

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer: 18.30 knots; 15% "Design" Margin; 20% "Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	39,280	275.0
Crew/Oper/M&R	19,210	134.5
Total Cost/Day	58,490	409.4

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	125	289	414	1,159

Option 3

AMH SERVICE PROFORMA — Vessel Class: **04-RoRo Med 20kt** — 5

East Coast: Delaware River - South Florida - Canaveral - Delaware River

Arrive at Pilot Station Day	Time	Pilot Steam In Hours	Arrive at Dock Time	Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Time	Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
THU	22:00	8.0	06:00	0.0	Delaware River	14	17:00	2.0	50	100	FRI	20:00	0.6	8.0	48.0	861	18.0	19,080
MON	04:00	2.0	06:00	3.0	Miami	14	17:00	3.0	50	150	MON	20:00	3.6	2.0	13.0	175	14.0	24,540
TUE	11:00	2.0	13:00	4.3	Port Canaveral	7	17:00	3.0	50	150	TUE	20:00	4.6	2.0	48.0	730	15.3	23,840
THU	22:00		22:00	6.7	Delaware River													
TOTALS		**12.0**				**35**		**8.0**		**400**				**12.0**	**109**	**1,766**	**16.2**	67,460

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	12.0	0.5	7.1%
Port	35.0	1.5	20.8%
Pilot Out	12.0	0.5	7.1%
Steaming	109.0	4.5	64.9%
Buffer	-	0.0	0.0%
Total	168.0	7.0	100.0%

Voyage Cost	@Sea	Pilot	Docking	In Port	Total	Cost Per Voyage, 000s @Sea	Pilot	Docking	In Port	$000s/ VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	4.54	0.75	0.25	1.46	7.0							
Vessel Hire					7.0					404.6	1,289	460
Fuel Cons ME mt/day	42.6	29.9	14.2	0.0		198.1	22.9	3.6	-	224.7	716	256
Fuel Cons Aux mt/day	3.5	3.5	10.5	3.5		16.3	2.7	2.7	5.2	26.9	86	31
Port Calls										67.5	215	77
Total								Total Voyage		**723.7**	**2,305**	**823**

Key Transit Times

Depart	Arrive	Days
DelRiver	SoFlor	2.4
DelRiver	Canav	3.7
Canav	DelRiver	2.4
NYNJ	DelRiver	7.0

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	154	160	314	879

Fuel Cost and Consumption Inputs

	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025
Consumption Rates (mt/day)				
ME Cons (20% SeaMrgn)	70.8	29.9	14.2	0.0
Aux Cons	3.5	3.5	10.5	3.5

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer: 20.00 knots

15% "Design" Margin

20% "Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	38,590	270.1
Crew/Oper/M&R	19,210	134.5
Total Cost/Day	57,800	404.6

AMH SERVICE PROFORMA — Vessel Class: **01-RoRo Small 18kt** — 3

East Coast: Delaware River - South Florida - Canaveral - Delaware River

Arrive at Pilot Station Day	Time	Pilot Steam In Hours	Arrive at Dock Time	Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Time	Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
THU	22:00	8.0	06:00	0.0	Delaware River	14	17:00	2.0	50	100	FRI	20:00	0.6	8.0	48.0	861	18.0	17,440
MON	04:00	2.0	06:00	3.0	Miami	14	17:00	3.0	50	150	MON	20:00	3.6	2.0	13.0	175	14.0	21,990
TUE	11:00	2.0	13:00	4.3	Port Canaveral	7	17:00	3.0	50	150	TUE	20:00	4.6	2.0	48.0	730	15.3	21,470
THU	22:00		22:00	6.7	Delaware River													
TOTALS		**12.0**				**35**		**8.0**		**400**				**12.0**	**109**	**1,766**	**16.2**	60,900

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	12.0	0.5	7.1%
Port	35.0	1.5	20.8%
Pilot Out	12.0	0.5	7.1%
Steaming	109.0	4.5	64.9%
Buffer	-	0.0	0.0%
Total	168.0	7.0	100.0%

Voyage Cost	@Sea	Pilot	Docking	In Port	Total	Cost Per Voyage, 000s @Sea	Pilot	Docking	In Port	$000s/ VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	4.54	0.75	0.25	1.46	7.0							
Vessel Hire					7.0					333.5	2,208	788
Fuel Cons ME mt/day	32.6	24.3	9.1	0.0		151.8	18.6	2.3	-	172.8	1,144	409
Fuel Cons Aux mt/day	3.5	3.5	10.5	3.5		16.3	2.7	2.7	5.2	26.9	178	64
Port Calls										60.9	403	144
Total								Total Voyage		**594.1**	**3,934**	**1,404**

Key Transit Times

Depart	Arrive	Days
DelRiver	SoFlor	2.4
DelRiver	Canav	3.7
Canav	DelRiver	2.4
NYNJ	DelRiver	7.0

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	71	80	151	423

Fuel Cost and Consumption Inputs

	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025
Consumption Rates (mt/day)				
ME Cons (20% SeaMrgn)	45.5	24.3	9.1	0.0
Aux Cons	3.5	3.5	10.5	3.5

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer: 18.50 knots

15% "Design" Margin

20% "Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	29,230	204.6
Crew/Oper/M&R	18,410	128.9
Total Cost/Day	47,640	333.5

Option 3 (cont'd)

AMH SERVICE PROFORMA — Vessel Class: **21-Cont Feeder 18 kt**

East Coast: New York/New Jersey - South Florida - Canaveral - New York/New Jersey

Arrive at Pilot Station Day	Arrive at Pilot Station Time	Pilot Steam In Hours	Arrive at Dock Time	Arrive at Dock Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Undocking Time Time	Undocking Time Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
THU	23:00	8.0	07:00	0.0	Delaware River	13	17:00	3.0	50	150	FRI	20:00	0.5	8.0	51.0	861	17.0	21,280
MON	07:00	2.0	09:00	3.1	Miami	11	17:00	3.0	50	150	MON	20:00	3.5	2.0	13.0	175	14.0	24,540
TUE	11:00	2.0	13:00	4.2	Port Canaveral	8	18:00	3.0	50	150	TUE	21:00	4.6	2.0	48.0	730	15.3	23,840
THU	23:00		23:00	6.7	Delaware River													
TOTALS		**12.0**				**32**		**9.0**		**450**				**12.0**	**112**	**1,766**	**15.8**	69,660

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	12.0	0.5	7.1%
Port	32.0	1.3	19.0%
Pilot Out	12.0	0.5	7.1%
Steaming	112.0	4.7	66.7%
Buffer	-	0.0	0.0%
Total	168.0	7.0	100.0%

Voyage Cost	@Sea	Pilot	Docking	In Port	Total	Cost Per Voyage, 000s @Sea	Pilot	Docking	In Port	$000s/ VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	4.67	0.75	0.25	1.33	7.0							
Vessel Hire					7.0					270.6	690	328
Fuel Cons ME mt/day	30.5	23.9	8.2	0.0		145.7	18.3	2.1	-	166.1	424	201
Fuel Cons Aux mt/day	2.0	2.0	6.0	2.0		9.6	1.5	1.5	2.7	15.4	39	19
Port Calls										69.7	178	84
Total								Total Voyage		**521.7**	**1,331**	**632**

Key Transit Times

Depart	Arrive	Days
NYNJ	SoFlor	2.5
NYNJ	Canav	3.7
Canav	NYNJ	2.4
NYNJ	NYNJ	7.0

Fuel Cost and Consumption Inputs

	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer: 18.00 knots; 15% "Design" Margin; 20% "Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	20,110	140.8
Crew/Oper/M&R	18,540	129.8
Total Cost/Day	36,650	270.6

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	0	392	392	826

Consumption Rates (mt/day)

	@Sea	Pilot	Docking	In Port
ME Cons (20% SeaMrgn)	41.2	23.9	8.2	0.0
Aux Cons	2.0	2.0	6.0	2.0

AMH SERVICE PROFORMA — Vessel Class: **12-Rocon Large 18kt**

East Coast: New York/New Jersey - South Florida - Canaveral - New York/New Jersey

Arrive at Pilot Station Day	Arrive at Pilot Station Time	Pilot Steam In Hours	Arrive at Dock Time	Arrive at Dock Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Undocking Time Time	Undocking Time Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
THU	23:00	8.0	07:00	0.0	Delaware River	13	17:00	3.0	50	150	FRI	20:00	0.5	8.0	51.0	861	17.0	21,280
MON	07:00	2.0	09:00	3.1	Miami	11	17:00	3.0	50	150	MON	20:00	3.5	2.0	13.0	175	14.0	24,540
TUE	11:00	2.0	13:00	4.2	Port Canaveral	8	18:00	3.0	50	150	TUE	21:00	4.6	2.0	48.0	730	15.3	23,840
THU	23:00		23:00	6.7	Delaware River													
TOTALS		**12.0**				**32**		**9.0**		**450**				**12.0**	**112**	**1,766**	**15.8**	69,660

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	12.0	0.5	7.1%
Port	32.0	1.3	19.0%
Pilot Out	12.0	0.5	7.1%
Steaming	112.0	4.7	66.7%
Buffer	-	0.0	0.0%
Total	168.0	7.0	100.0%

Voyage Cost	@Sea	Pilot	Docking	In Port	Total	Cost Per Voyage, 000s @Sea	Pilot	Docking	In Port	$000s/ VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	4.67	0.75	0.25	1.33	7.0							
Vessel Hire					7.0					409.4	989	353
Fuel Cons ME mt/day	30.5	34.6	12.6	0.0		145.7	26.6	3.2	-	175.5	424	151
Fuel Cons Aux mt/day	3.7	3.7	11.1	3.7		17.7	2.8	2.8	5.1	28.4	69	25
Port Calls										69.7	168	60
Total								Total Voyage		**683.0**	**1,650**	**589**

Key Transit Times

Depart	Arrive	Days
NYNJ	SoFlor	2.5
NYNJ	Canav	3.7
Canav	NYNJ	2.4
NYNJ	NYNJ	7.0

Fuel Cost and Consumption Inputs

	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer: 18.30 knots; 15% "Design" Margin; 20% "Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	39,280	275.0
Crew/Oper/M&R	19,210	134.5
Total Cost/Day	58,490	409.4

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	125	289	414	1,159

Consumption Rates (mt/day)

	@Sea	Pilot	Docking	In Port
ME Cons (20% SeaMrgn)	62.8	34.6	12.6	0.0
Aux Cons	3.7	3.7	11.1	3.7

Option 5

AMH SERVICE PROFORMA

East Coast: Del River & Norfolk - Mass & Maine (Via Cape Cod and C&D Canals)

Vessel Class: **03-RoRo Med 24kt** 4

Arrive at Pilot Station Day	Arrive at Pilot Station Time	Pilot Steam In Hours	Arrive at Dock Time	Arrive at Dock Days	Port	Tot Hrs In Port	Cut-Off Time	Wrk Hrs Aft Cut	Load Rate/Hr	Max Units After Cut	Undocking Time Day	Undocking Time Time	Undocking Time Days	Pilot Steam Out Hours	Sea Steaming Hours	Sea Distance Naut Miles	Speed Knots	Estimated Port Cost
TUE	9:00	2.0	11:00	0.0	New Bedford, MA **	4	11:00	3.0	60	180	TUE	15:00	0.2	3.0	7.0	149	22.0	13,390
WED	01:00	2.0	03:00	0.7	Portland, ME **	4	5:00	2.0	60	120	WED	7:00	0.8	3.0	18.0	393	22.0	13,390
THU	04:00	8.0	12:00	2.0	Del River *	4	13:00	3.0	60	180	THU	16:00	2.2	4.0	-	1	22.0	20,760
THU	20:00	5.0	01:00	2.6	Baltimore	4	2:00	3.0	60	180	FRI	5:00	2.8	10.0	18.0	402	22.0	18,080
SAT	09:00	3.0	12:00	4.0	Charleston	4	13:00	3.0	60	180	SAT	16:00	4.2	3.0	5.0	116	22.0	17,920
SUN	00:00	3.0	03:00	4.7	Wilmington	4	4:00	3.0	60	180	SUN	7:00	4.8	3.0	14.0	311	22.0	17,920
MON	00:00	10.0	10:00	6.0	Baltimore*	4	11:00	3.0	60	180	MON	14:00	6.1	5.0	12.0	255	22.0	18,080
TUE	07:00		07:00	6.8	New Bedford, MA **													
TOTALS		**33.0**				**28**		**20.0**		**1,200**				**31.0**	**74**	**1,627**	**22.0**	119,540

TOTAL VOYAGE SUMMARY

	Hours	Days	%
Pilot In	33.0	1.4	19.6%
Port	28.0	1.2	16.7%
Pilot Out	31.0	1.3	18.5%
Steaming	74.0	3.1	44.0%
Buffer	2.0	0.1	1.2%
Total	168.0	7.0	100.0%

Voyage Cost	Cost Per Voyage, 000s @Sea	Pilot	Docking	In Port	Total	$000s/ VoyR-T	R-T $/Unit	R-T $/TEU
Distribution of Days	3.08	2.08	0.58	1.17	6.9			
Vessel Hire					7.0	447.8	1,756	627
Fuel Cons ME mt/day	72.9	27.3	21.5	0.0	230.5	301.6	1,183	422
Fuel Cons Aux mt/day	4.0	4.0	12.0	4.0	12.6	33.1	130	46
Port Calls						119.5	469	167
Total					Total Voyage	**902.1**	**3,538**	**1,263**

Key Transit Times

Depart	Arrive	Days
NewEng	NewEng	0.5
NewEng	DelRiver	1.9
DelRiver	NewEng	4.8
NRF	NewEng	4.2

Vessel Capacity Inputs

	Trailers	Cont	Total Units	Total TEU
Nominal				
Effective	104	151	255	714

Fuel Cost and Consumption Inputs

	@Sea	Pilot	Docking	In Port
% MDO/MGO Consumed				
ME	100%	100%	100%	100%
Aux	100%	100%	100%	100%
Average Cost $/mt				
ME	1,025	1,025	1,025	1,025
Aux	1,025	1,025	1,025	1,025
Consumption Rates (mt/day)				
ME Cons (20% SeaMrgn)	107.6	27.3	21.5	0.0
Aux Cons	4.0	4.0	12.0	4.0

Fuel Price $/mt	
IF 380	650
MDO	1025

ME Cons Refer:	
23.70	knots
15%	"Design" Margin
20%	"Service" Margin

Vessel Cost	$/Day	$000/Voy
Vessel Ownership	44,760	313.3
Crew/Oper/M&R	19,210	134.5
Total Cost/Day	63,970	447.8

APPENDIX K: M-95 P&L WORKSHEETS

Summary Results

Summary Results of Service Viability Analysis

Profit (Loss) - $000s per Week

Service Opt / Voy Duration	Vessel Type	Sailings / Week	Base Case	Unfavorable Sensitivty	Favorable Sensitivity	Base Case	Unfavorable Sensitivty	Favorable Sensitivity
Volume Case:			**25% Mkt Capture / to Max 90% Util**			**Force Utilization to 90% (Both Ways)**		
Option 1	**Portland - New Bedford - Del River - Baltimore - Portland**							
a) 4.0 day	vsl 03	1.7	(1,038)	(1,197)	(906)	(1,076)	(1,235)	(895)
b) 5.0 day	vsl 04	2.8	(1,528)	(1,763)	(1,396)	(1,690)	(1,925)	(1,326)
c) 5.0 day	vsl 01	2.8	(1,291)	(1,473)	(1,159)	(1,325)	(1,507)	(1,150)
d) 5.0 day	vsl 11	2.8	(1,247)	(1,537)	(1,207)	(1,491)	(1,782)	(1,098)
Option 2	**NYNJ - Miami - Port Canaveral - NYNJ**							
a) 7day	vsl 04	2.0	(1,258)	(1,523)	(1,105)	(1,042)	(1,308)	(918)
b) 7day	vsl 01	2.0	(1,050)	(1,255)	(978)	(994)	(1,199)	(920)
c) 7day	vsl 21	2.0	(875)	(1,036)	(732)	(462)	(622)	(271)
d) 7day	vsl 12	2.0	(1,189)	(1,434)	(1,045)	(738)	(983)	(537)
Option 3	**Del River - Miami - Port Canaveral - Del River**							
a) 7day	vsl 04	2.0	(1,371)	(1,628)	(1,306)	(838)	(1,095)	(703)
b) 7day	vsl 01	2.0	(1,112)	(1,310)	(1,047)	(924)	(1,122)	(859)
c) 7day	vsl 21	2.0	(984)	(1,125)	(923)	(382)	(451)	(213)
d) 7day	vsl 12	2.0	(1,306)	(1,547)	(1,246)	(665)	(905)	(486)
Option 5	**Nw Bed - PortInd - Del Riv - Balt - Charl - Wilm - Balt - Nw Bed**							
a) 7day	vsl 03	2.0	(1,609)	(1,919)	(1,393)	(1,506)	(1,816)	(1,290)

Overview of Sensitivity Assumptions	**Base Case:**	Alternate Case: **Unfavorable**	Alternate Case: **Favorable**
Fuel Cost (MDO/MGO), $/mt	$1,025	$1,230	$1,025
Vsl Mortgage Interest Rate	6%	8%	6%
Assumed Return on Vessel Equity	8%	18%	8%
Handling Cost	ILA Costs	ILA Costs	Reduced Costs
Cargo Density, ton/ld	20	20	16
Local Port Drayage Total $/Ld	$300	$300	$200

Service Option 1

Service Option #1-1
Port Rotation: **Portland - New Bedford - Del River - Baltimore - Portland**

Southbound Volumes: Load Port	FAF Origin	FAF Dest	Disch Por	Tons p.a. 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	$/Unit Origin Loading	$/Unit Dest Disch	Handling Cost/ wk	Rate Per Unit	Rev per week
									ILA Costs				
Portland	Maine	Phil NI	Del River	460	25%	20	5,750	111	205	230	48,111	420	46,452
Portland	Maine	Phil	Del River	306	25%	20	3,825	74	205	230	32,016	420	30,912
Portland	Maine	MD Rem	Baltimore	13	25%	20	163	3	205	295	1,550	555	1,721
Portland	Maine	Balt	Baltimore	62	25%	20	775	15	205	295	7,450	555	8,270
New Bedford	Boston	Phil NI	Del River	-	25%	20	-	-	205	230	-		-
New Bedford	Boston	Phil	Del River	-	25%	20	-	-	205	230	-		-
New Bedford	Boston	MD Rem	Baltimore	69	25%	20	863	17	205	295	8,300	420	6,972
New Bedford	Boston	Balt	Baltimore	88	25%	20	1,100	21	205	295	10,600	420	8,904
New Bedford	MA Rem/RI/CTR	Phil NI	Del River	-	25%	20	-	-	205	230	-		-
New Bedford	MA Rem/RI/CTR	Phil	Del River	-	25%	20	-	-	205	230	-		-
New Bedford	MA Rem/RI/CTR	MD Rem	Baltimore	36	25%	20	450	9	205	295	4,350	420	3,654
New Bedford	MA Rem/RI/CTR	Balt	Baltimore	43	25%	20	538	10	205	295	5,150	420	4,326
Southbound Total				1,077			13,463	259			117,527		**111,210**
Del River	Phil NI	Maine	Portland	76	25%	20	950	18	230	205	7,961	285	5,216
Del River	Phil NI	Boston	New Bedf	-	25%	20	-	-	230	205	-		-
Del River	Phil NI	MA Rem/RI	New Bedf	-	25%	20	-	-	230	205	-		-
Del River	Phil	Maine	Portland	127	25%	20	1,588	31	230	205	13,268	285	8,693
Del River	Phil	Boston	New Bedf	-	25%	20	-	-	230	205	-		-
Del River	Phil	MA Rem/RI	New Bedf	-	25%	20	-	-	230	205	-		-
Baltimore	MD Rem	Maine	Portland	9	25%	20	113	2	295	205	1,100	410	902
Baltimore	MD Rem	Boston	New Bedf	79	25%	20	988	19	295	205	9,500	255	4,845
Baltimore	MD Rem	MA Rem/RI	New Bedf	89	25%	20	1,113	21	295	205	10,700	255	5,457
Baltimore	Balt	Maine	Portland	314	25%	20	3,925	76	295	205	37,750	410	30,955
Baltimore	Balt	Boston	New Bedf	348	25%	20	4,350	84	295	205	41,850	255	21,344
Baltimore	Balt	MA Rem/RI	New Bedf	113	25%	20	1,413	27	295	205	13,600	255	6,936
Northbound Total				1,155		240	14,438	278			135,728		**84,347**
Grand Total Loads							**27,900**	**537**			**253,255**		**195,557**
Per Load											$472		$364

Voy Option	Ship Type	Cap/Voy	Voy Days	Vsl Voy Costs	Vsl Own/Op	Fuel Costs	Port Calls	Avg Speed
a) 4.0 day	vsl03	255	4.0	519	258.5	196.8	63.4	21.7
b) 5.0 day	vsl04	314	5.0	492	286.6	139.7	65.3	15.2
c) 5.0 day	vsl01	151	5.0	408	236.2	111.4	60.3	15.2
d) 5.0 day	vsl11	426	5.0	399	178.6	150.7	69.4	13.2

Sensitivities:	**Base Case:**	**Alternate Case:** Unfavorable	**Alternate Case:** Favorable
Fuel Cost (MDO/MGO)	$1,025 per ton	$1,230 per ton	$1,025 per ton
Vsl Mortgage Rate	6%	8%	6%
Return on Vessel Equity	8%	18%	8%
Handling Cost	ILA Costs	ILA Costs	Reduced Costs
Cargo Density	20 ton/Ld	20 ton/Ld	16 ton/Ld
Local Port Dray Cost	$ 300 Per Local Port Dray	$ 300 Per Local Port Dray	200 Per Local Port Dray

Service Option 1 – Vessel 3 – Ro-Ro Med 24kt

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 1		<= Cap	Assumed Util.			<= Cap	Assumed Util.			<= Cap	Assumed Util.	
VslClass vsl03	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**
03-RoRo Med 24kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Own&Oper Cost	258.5	258.5			310.9	310.9			258.5	258.5		
Fuel Cost	196.8	196.8			236.2	236.2			196.8	196.8		
Port Call Cost	63.4	63.4			63.4	63.4			63.4	63.4		
Total Cost/Voy	518.8	518.8			610.5	610.5			518.8	518.8		
Voy Duration	4.0	4.0			4.0	4.0			4.0	4.0		
Ships Deployed	1.0	1.0			1.0	1.0			1.0	1.0		
Voy/wk	1.7	1.7			1.7	1.7			1.7	1.7		
Vessel Service Cost/wk	898.5	898.5			1057.3	1057.3			898.5	898.5		
Service Mgmnt/wk	55.0	55.0			55.0	55.0			55.0	55.0		
Subtotal - FixedCost/wk	953.5	953.5	953.5	953.5	1112.3	1112.3	1112.3	1112.3	953.5	953.5	953.5	953.5
1-way Cap/Voy (100%)	255	255	255	255	255	255	255	255	255	255	255	255
1-way Cap/wk (100%)	442	442	442	442	442	442	442	442	442	442	442	442
SB Lds/wk	259	259	397	287	259	259	397	287	323	323	397	287
NB Ld/wk	278	278	397	287	278	278	397	287	347	347	397	287
Total Lds/wk	537	537	795	574	537	537	795	574	671	671	795	574
Utilization SB	59%	59%	90%	65%	59%	59%	90%	65%	73%	73%	90%	65%
NB	63%	63%	90%	65%	63%	63%	90%	65%	79%	79%	90%	65%
Average	61%	61%	90%	65%	61%	61%	90%	65%	76%	76%	90%	65%
SB Handling $000s/wk	117.5	117.5	180.4	130.3	117.5	117.5	180.4	130.3	106.5	106.5	130.9	94.6
NB Handling $000s/wk	135.7	135.7	194.2	140.3	135.7	135.7	194.2	140.3	123.6	123.6	141.6	102.3
HMT/wk 50	26.8	26.8	39.7	28.7	26.8	26.8	39.7	28.7	33.5	33.5	39.7	28.7
Subtotal VarCost/wk ($000s)	280.1	280.1	414.3	299.2	280.1	280.1	414.3	299.2	263.7	263.7	312.3	225.5
Avg Var Cost / Load		*522*	*521*	*521*		*522*	*521*	*521*		*393*	*393*	*393*
Grand Total Costs/wk ($000s)	**1,234**	**1,234**	**1,368**	**1,253**	**1,392**	**1,392**	**1,527**	**1,412**	**1,217**	**1,217**	**1,266**	**1,179**
SB Rev/wk	111.2	111.2	170.7	123.3	111.2	111.2	170.7	123.3	171.2	171.2	210.4	152.0
NB Rev/wk	84.3	84.3	120.7	87.2	84.3	84.3	120.7	87.2	140.1	140.1	160.4	115.9
SubTotal Rev/wk ($000s)	**195.6**	**195.6**	**291.4**	**210.4**	**195.6**	**195.6**	**291.4**	**210.4**	**311.3**	**311.3**	**370.9**	**267.8**
Net Result ($000s / wk)	**(1,038)**	**(1,038)**	**(1,076)**	**(1,042)**	**(1,197)**	**(1,197)**	**(1,235)**	**(1,201)**	**(906)**	**(906)**	**(895)**	**(911)**
Cost/Load Handled	*($2,298)*	*($2,298)*	*($1,721)*	*($2,182)*	*($2,594)*	*($2,594)*	*($1,920)*	*($2,459)*	*($1,815)*	*($1,815)*	*($1,592)*	*($2,054)*
Rev/Load	*$364*	*$364*	*$367*	*$367*	*$364*	*$364*	*$367*	*$367*	*$464*	*$464*	*$467*	*$467*
Net/Load	*($1,934)*	*($1,934)*	*($1,354)*	*($1,815)*	*($2,230)*	*($2,230)*	*($1,554)*	*($2,092)*	*($1,351)*	*($1,351)*	*($1,126)*	*($1,587)*

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 1		<= Cap	Assumed Util.			<= Cap	Assumed Util.			<= Cap	Assumed Util.	
VslClass vsl03	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%
03-RoRo Med 24kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Distribution of Costs - Opt 1, Vessel 3												
VesselCapital $/day	$44,760											
Crew & Oper.	$19,210											
Vsl Sum $/Day	$63,970											
$/Voy	$258.55											
$/week/vsl	$447.79											
$/week	$895.58											
Cost per week												
Vessel Capital	313.3	313.3	313.3	313.3	404.0	404.0	404.0	404.0	313.3	313.3	313.3	313.3
Vessel Crew & Operating	134.5	134.5	134.5	134.5	134.5	134.5	134.5	134.5	134.5	134.5	134.5	134.5
Fuel	340.9	340.9	340.9	340.9	409.1	409.1	409.1	409.1	340.9	340.9	340.9	340.9
Port Call Cost	109.8	109.8	109.8	109.8	109.8	109.8	109.8	109.8	109.8	109.8	109.8	109.8
Service Management	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Subtotal Vessel	953.5	953.5	953.5	953.5	1,112.3	1,112.3	1,112.3	1,112.3	953.5	953.5	953.5	953.5
Handling	253.3	253.3	374.6	270.5	253.3	253.3	374.6	270.5	230.2	230.2	272.5	196.8
HMT	26.8	26.8	39.7	28.7	26.8	26.8	39.7	28.7	33.5	33.5	39.7	28.7
Total Costs/week	1,233.6	1,233.6	1,367.8	1,252.7	1,392.4	1,392.4	1,526.7	1,411.6	1,217.2	1,217.2	1,265.8	1,179.0
% of Weekly Costs												
Vessel Capital	25.4%	25.4%	22.9%	25.0%	29.0%	29.0%	26.5%	28.6%	25.7%	25.7%	24.8%	26.6%
Vessel Crew & Operating	10.9%	10.9%	9.8%	10.7%	9.7%	9.7%	8.8%	9.5%	11.0%	11.0%	10.6%	11.4%
Fuel	27.6%	27.6%	24.9%	27.2%	29.4%	29.4%	26.8%	29.0%	28.0%	28.0%	26.9%	28.9%
Port Call Cost	8.9%	8.9%	8.0%	8.8%	7.9%	7.9%	7.2%	7.8%	9.0%	9.0%	8.7%	9.3%
Service Management	4.5%	4.5%	4.0%	4.4%	3.9%	3.9%	3.6%	3.9%	4.5%	4.5%	4.3%	4.7%
Subtotal Vessel	77.3%	77.3%	69.7%	76.1%	79.9%	79.9%	72.9%	78.8%	78.3%	78.3%	75.3%	80.9%
Handling	20.5%	20.5%	27.4%	21.6%	18.2%	18.2%	24.5%	19.2%	18.9%	18.9%	21.5%	16.7%
HMT	2.2%	2.2%	2.9%	2.3%	1.9%	1.9%	2.6%	2.0%	2.8%	2.8%	3.1%	2.4%
Total Costs/week	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Service Option 1 – Vessel 4 – Ro-Ro Med 20kt

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 1		<= Cap	Assumed Util.			<= Cap	Assumed Util.			<= Cap	Assumed Util.	
VslClass vsl04	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%
04-RoRo Med 20kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Own&Oper Cost	286.6	286.6			342.0	342.0			286.6	286.6		
Fuel Cost	139.7	139.7			167.7	167.7			139.7	139.7		
Port Call Cost	65.3	65.3			65.3	65.3			65.3	65.3		
Total Cost/Voy	491.6	491.6			575.0	575.0			491.6	491.6		
Voy Duration	5.0	5.0			5.0	5.0			5.0	5.0		
Ships Deployed	2.0	2.0			2.0	2.0			2.0	2.0		
Voy/wk	2.8	2.8			2.8	2.8			2.8	2.8		
Vessel Service Cost/wk	1388.1	1388.1			1623.4	1623.4			1388.1	1388.1		
Service Mgmnt/wk	55.0	55.0			55.0	55.0			55.0	55.0		
Subtotal - FixedCost/wk ($000s	1443.1	1443.1	1443.1	1443.1	1678.4	1678.4	1678.4	1678.4	1443.1	1443.1	1443.1	1443.1
1-way Cap/Voy (100%)	314	314	314	314	314	314	314	314	314	314	314	314
1-way Cap/wk (100%)	887	887	887	887	887	887	887	887	887	887	887	887
SB Lds/wk	259	259	798	576	259	259	798	576	323	323	798	576
NB Ld/wk	278	278	798	576	278	278	798	576	347	347	798	576
Total Lds/wk	537	537	1,596	1,153	537	537	1,596	1,153	671	671	1,596	1,153
Utilization SB	29%	29%	90%	65%	29%	29%	90%	65%	36%	36%	90%	65%
NB	31%	31%	90%	65%	31%	31%	90%	65%	39%	39%	90%	65%
Average	30%	30%	90%	65%	30%	30%	90%	65%	38%	38%	90%	65%
SB Handling $000s/wk	117.5	117.5	362.1	261.5	117.5	117.5	362.1	261.5	106.5	106.5	262.9	189.8
NB Handling $000s/wk	135.7	135.7	389.9	281.6	135.7	135.7	389.9	281.6	123.6	123.6	284.2	205.3
HMT/wk 50	26.8	26.8	79.8	57.6	26.8	26.8	79.8	57.6	33.5	33.5	79.8	57.6
Subtotal VarCost/wk ($000s)	280.1	280.1	831.7	600.7	280.1	280.1	831.7	600.7	263.7	263.7	626.9	452.7
Avg Var Cost / Load		*522*	*521*	*521*		*522*	*521*	*521*		*393*	*393*	*393*
Grand Total Costs/wk ($000s)	**1,723**	**1,723**	**2,275**	**2,044**	**1,959**	**1,959**	**2,510**	**2,279**	**1,707**	**1,707**	**2,070**	**1,896**
SB Rev/wk	111.2	111.2	342.6	247.4	111.2	111.2	342.6	247.4	171.2	171.2	422.4	305.1
NB Rev/wk	84.3	84.3	242.3	175.0	84.3	84.3	242.3	175.0	140.1	140.1	322.1	232.6
SubTotal Rev/wk ($000s)	**195.6**	**195.6**	**584.9**	**422.4**	**195.6**	**195.6**	**584.9**	**422.4**	**311.3**	**311.3**	**744.5**	**537.7**
Net Result ($000s / wk)	**(1,528)**	**(1,528)**	**(1,690)**	**(1,621)**	**(1,763)**	**(1,763)**	**(1,925)**	**(1,857)**	**(1,396)**	**(1,396)**	**(1,326)**	**(1,358)**
Cost/Load Handled	*($3,210)*	*($3,210)*	*($1,425)*	*($1,773)*	*($3,648)*	*($3,648)*	*($1,573)*	*($1,977)*	*($2,546)*	*($2,546)*	*($1,297)*	*($1,645)*
Rev/Load	*$364*	*$364*	*$367*	*$367*	*$364*	*$364*	*$367*	*$367*	*$464*	*$464*	*$467*	*$467*
Net/Load	*($2,846)*	*($2,846)*	*($1,059)*	*($1,407)*	*($3,284)*	*($3,284)*	*($1,206)*	*($1,611)*	*($2,081)*	*($2,081)*	*($831)*	*($1,178)*

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 1		<= Cap	Assumed Util.			<= Cap	Assumed Util.			<= Cap	Assumed Util.	
VslClass vsl04	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%
04-RoRo Med 20kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Distribution of Costs - Opt 1, Vessel 4												
VesselCapital $/day	$38,590											
Crew & Oper.	$19,210											
Vsl Sum $/Day	$57,800											
$/Voy	$286.59											
$/week/vsl	$404.60											
$/week	$809.20											
Cost per week												
Vessel Capital	540.3	540.3	540.3	540.3	696.6	696.6	696.6	696.6	540.3	540.3	540.3	540.3
Vessel Crew & Operating	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9
Fuel	394.5	394.5	394.5	394.5	473.4	473.4	473.4	473.4	394.5	394.5	394.5	394.5
Port Call Cost	184.4	184.4	184.4	184.4	184.4	184.4	184.4	184.4	184.4	184.4	184.4	184.4
Service Management	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Subtotal Vessel	1,443.1	1,443.1	1,443.1	1,443.1	1,678.4	1,678.4	1,678.4	1,678.4	1,443.1	1,443.1	1,443.1	1,443.1
Handling	253.3	253.3	751.9	543.1	253.3	253.3	751.9	543.1	230.2	230.2	547.1	395.1
HMT	26.8	26.8	79.8	57.6	26.8	26.8	79.8	57.6	33.5	33.5	79.8	57.6
Total Costs/week	1,723.2	1,723.2	2,274.9	2,043.8	1,958.5	1,958.5	2,510.1	2,279.1	1,706.8	1,706.8	2,070.0	1,895.9
% of Weekly Costs												
Vessel Capital	31.4%	31.4%	23.7%	26.4%	35.6%	35.6%	27.8%	30.6%	31.7%	31.7%	26.1%	28.5%
Vessel Crew & Operating	15.6%	15.6%	11.8%	13.2%	13.7%	13.7%	10.7%	11.8%	15.8%	15.8%	13.0%	14.2%
Fuel	22.9%	22.9%	17.3%	19.3%	24.2%	24.2%	18.9%	20.8%	23.1%	23.1%	19.1%	20.8%
Port Call Cost	10.7%	10.7%	8.1%	9.0%	9.4%	9.4%	7.3%	8.1%	10.8%	10.8%	8.9%	9.7%
Service Management	3.2%	3.2%	2.4%	2.7%	2.8%	2.8%	2.2%	2.4%	3.2%	3.2%	2.7%	2.9%
Subtotal Vessel	83.7%	83.7%	63.4%	70.6%	85.7%	85.7%	66.9%	73.6%	84.6%	84.6%	69.7%	76.1%
Handling	14.7%	14.7%	33.1%	26.6%	12.9%	12.9%	30.0%	23.8%	13.5%	13.5%	26.4%	20.8%
HMT	1.6%	1.6%	3.5%	2.8%	1.4%	1.4%	3.2%	2.5%	2.0%	2.0%	3.9%	3.0%
Total Costs/week	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Service Option 1 – Vessel 1 – Ro-Ro Small 18kt

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 1		<= Cap	Assumed Util.			<= Cap	Assumed Util.			<= Cap	Assumed Util.	
VslClass vsl01	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%
01-RoRo Small 18kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Own&Oper Cost	236.2	236.2			278.2	278.2			236.2	236.2		
Fuel Cost	111.4	111.4			133.6	133.6			111.4	111.4		
Port Call Cost	60.3	60.3			60.3	60.3			60.3	60.3		
Total Cost/Voy	407.9	407.9			472.1	472.1			407.9	407.9		
Voy Duration	5.0	5.0			5.0	5.0			5.0	5.0		
Ships Deployed	2.0	2.0			2.0	2.0			2.0	2.0		
Voy/wk	2.8	2.8			2.8	2.8			2.8	2.8		
Vessel Service Cost/wk	1151.6	1151.6			1333.0	1333.0			1151.6	1151.6		
Service Mgmnt/wk	55.0	55.0			55.0	55.0			55.0	55.0		
Subtotal - FixedCost/wk	1206.6	1206.6	1206.6	1206.6	1388.0	1388.0	1388.0	1388.0	1206.6	1206.6	1206.6	1206.6
1-way max/Voy (100%)	151	151	151	151	151	151	151	151	151	151	151	151
1-way Cap/wk (100%)	426	426	426	426	426	426	426	426	426	426	426	426
SB Lds/wk	259	259	384	277	259	259	384	277	323	323	384	277
NB Ld/wk	278	278	384	277	278	278	384	277	347	347	384	277
Total Lds/wk	537	537	767	554	537	537	767	554	671	671	767	554
Utilization SB	61%	61%	90%	65%	61%	61%	90%	65%	76%	76%	90%	65%
NB	65%	65%	90%	65%	65%	65%	90%	65%	81%	81%	90%	65%
Average	63%	63%	90%	65%	63%	63%	90%	65%	79%	79%	90%	65%
SB Handling $000s/wk	117.5	117.5	174.1	125.8	117.5	117.5	174.1	125.8	106.5	106.5	126.4	91.3
NB Handling $000s/wk	135.7	135.7	187.5	135.4	135.7	135.7	187.5	135.4	123.6	123.6	136.7	98.7
HMT/wk 50	26.8	26.8	38.4	27.7	26.8	26.8	38.4	27.7	33.5	33.5	38.4	27.7
Subtotal VarCost/wk ($000s)	280.1	280.1	400.0	288.9	280.1	280.1	400.0	288.9	263.7	263.7	301.5	217.7
Avg Var Cost / Load		*522*	*521*	*521*		*522*	*521*	*521*		*393*	*393*	*393*
Grand Total Costs/wk ($000s)	**1,487**	**1,487**	**1,607**	**1,496**	**1,668**	**1,668**	**1,788**	**1,677**	**1,470**	**1,470**	**1,508**	**1,424**
SB Rev/wk	111.2	111.2	164.8	119.0	111.2	111.2	164.8	119.0	171.2	171.2	203.1	146.7
NB Rev/wk	84.3	84.3	116.5	84.1	84.3	84.3	116.5	84.1	140.1	140.1	154.9	111.9
SubTotal Rev/wk ($000s)	**195.6**	**195.6**	**281.3**	**203.1**	**195.6**	**195.6**	**281.3**	**203.1**	**311.3**	**311.3**	**358.0**	**258.6**
Net Result ($000s / wk)	**(1,291)**	**(1,291)**	**(1,325)**	**(1,292)**	**(1,473)**	**(1,473)**	**(1,507)**	**(1,474)**	**(1,159)**	**(1,159)**	**(1,150)**	**(1,166)**
Cost/Load Handled	*($2,770)*	*($2,770)*	*($2,093)*	*($2,698)*	*($3,107)*	*($3,107)*	*($2,330)*	*($3,025)*	*($2,193)*	*($2,193)*	*($1,965)*	*($2,570)*
Rev/Load	*$364*	*$364*	*$367*	*$367*	*$364*	*$364*	*$367*	*$367*	*$464*	*$464*	*$467*	*$467*
Net/Load	*($2,405)*	*($2,405)*	*($1,727)*	*($2,332)*	*($2,743)*	*($2,743)*	*($1,963)*	*($2,659)*	*($1,729)*	*($1,729)*	*($1,499)*	*($2,103)*

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 1		<= Cap	Assumed Util.			<= Cap	Assumed Util.			<= Cap	Assumed Util.	
VslClass vsl01	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%
01-RoRo Small 18kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Distribution of Costs - Opt 1, Vessel 01												
VesselCapital $/day	$29,230											
Crew & Oper.	$18,410											
Vsl Sum $/Day	$47,640											
$/Voy	$236.22											
$/week/vsl	$333.48											
$/week	$666.96											
Cost per week												
Vessel Capital	409.2	409.2	409.2	409.2	527.7	527.7	527.7	527.7	409.2	409.2	409.2	409.2
Vessel Crew & Operating	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7
Fuel	314.5	314.5	314.5	314.5	377.3	377.3	377.3	377.3	314.5	314.5	314.5	314.5
Port Call Cost	170.2	170.2	170.2	170.2	170.2	170.2	170.2	170.2	170.2	170.2	170.2	170.2
Service Management	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Subtotal Vessel	1,206.6	1,206.6	1,206.6	1,206.6	1,388.0	1,388.0	1,388.0	1,388.0	1,206.6	1,206.6	1,206.6	1,206.6
Handling	253.3	253.3	361.6	261.2	253.3	253.3	361.6	261.2	230.2	230.2	263.1	190.0
HMT	26.8	26.8	38.4	27.7	26.8	26.8	38.4	27.7	33.5	33.5	38.4	27.7
Total Costs/week	1,486.7	1,486.7	1,606.6	1,495.5	1,668.1	1,668.1	1,787.9	1,676.8	1,470.4	1,470.4	1,508.1	1,424.4
% of Weekly Costs												
Vessel Capital	27.5%	27.5%	25.5%	27.4%	31.6%	31.6%	29.5%	31.5%	27.8%	27.8%	27.1%	28.7%
Vessel Crew & Operating	17.3%	17.3%	16.0%	17.2%	15.5%	15.5%	14.4%	15.4%	17.5%	17.5%	17.1%	18.1%
Fuel	21.2%	21.2%	19.6%	21.0%	22.6%	22.6%	21.1%	22.5%	21.4%	21.4%	20.9%	22.1%
Port Call Cost	11.4%	11.4%	10.6%	11.4%	10.2%	10.2%	9.5%	10.2%	11.6%	11.6%	11.3%	12.0%
Service Management	3.7%	3.7%	3.4%	3.7%	3.3%	3.3%	3.1%	3.3%	3.7%	3.7%	3.6%	3.9%
Subtotal Vessel	81.2%	81.2%	75.1%	80.7%	83.2%	83.2%	77.6%	82.8%	82.1%	82.1%	80.0%	84.7%
Handling	17.0%	17.0%	22.5%	17.5%	15.2%	15.2%	20.2%	15.6%	15.7%	15.7%	17.4%	13.3%
HMT	1.8%	1.8%	2.4%	1.9%	1.6%	1.6%	2.1%	1.7%	2.3%	2.3%	2.5%	1.9%
Total Costs/week	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Service Option 1 – Vessel 11 – ATB 14kt Container/Ro-Ro

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 1		<= Cap	Assumed Util.			<= Cap	Assumed Util.			<= Cap	Assumed Util.	
VslClass vsl11	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%
011 - ATB 14 kt Cont/RoRo	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Own&Oper Cost	178.6	178.6			253.0	253.0			212.0	212.0		
Fuel Cost	150.7	150.7			180.9	180.9			150.7	150.7		
Port Call Cost	69.4	69.4			69.4	69.4			69.4	69.4		
Total Cost/Voy	398.7	398.7			503.2	503.2			432.1	432.1		
Voy Duration	5.0	5.0			5.0	5.0			5.0	5.0		
Ships Deployed	2.0	2.0			2.0	2.0			2.0	2.0		
Voy/wk	2.8	2.8			2.8	2.8			2.8	2.8		
Vessel Service Cost/wk	1107.1	1107.1			1397.4	1397.4			1199.9	1199.9		
Service Mgmnt/wk	55.0	55.0			55.0	55.0			55.0	55.0		
Subtotal - FixedCost/wk ($000s	1162.1	1162.1	1162.1	1162.1	1452.4	1452.4	1452.4	1452.4	1254.9	1254.9	1254.9	1254.9
1-way max/Voy (100%)	426	426	426	426	426	426	426	426	426	426	426	426
1-way Cap/wk (100%)	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183
SB Lds/wk	259	259	1,065	769	259	259	1,065	769	323	323	1,065	769
NB Ld/wk	278	278	1,065	769	278	278	1,065	769	347	347	1,065	769
Total Lds/wk	537	537	2,129	1,538	537	537	2,129	1,538	671	671	2,129	1,538
Utilization SB	22%	22%	90%	65%	22%	22%	90%	65%	27%	27%	90%	65%
NB	23%	23%	90%	65%	23%	23%	90%	65%	29%	29%	90%	65%
Average	23%	23%	90%	65%	23%	23%	90%	65%	28%	28%	90%	65%
SB Handling $000s/wk	117.5	117.5	483.1	348.9	117.5	117.5	483.1	348.9	106.5	106.5	350.7	253.3
NB Handling $000s/wk	135.7	135.7	520.2	375.7	135.7	135.7	520.2	375.7	123.6	123.6	379.2	273.9
HMT/wk $50	26.8	26.8	106.5	76.9	26.8	26.8	106.5	76.9	33.5	33.5	106.5	76.9
Subtotal VarCost/wk ($000s)	280.1	280.1	1,109.7	801.5	280.1	280.1	1,109.7	801.5	263.7	263.7	836.4	604.1
Avg Var Cost / Load		*522*	*521*	*521*		*522*	*521*	*521*		*393*	*393*	*393*
Grand Total Costs/wk ($000s)	**1,442**	**1,442**	**2,272**	**1,964**	**1,733**	**1,733**	**2,562**	**2,254**	**1,519**	**1,519**	**2,091**	**1,859**
SB Rev/wk	111.2	111.2	457.1	330.2	111.2	111.2	457.1	330.2	171.2	171.2	563.6	407.1
NB Rev/wk	84.3	84.3	323.3	233.5	84.3	84.3	323.3	233.5	140.1	140.1	429.7	310.4
SubTotal Rev/wk ($000s)	**195.6**	**195.6**	**780.4**	**563.6**	**195.6**	**195.6**	**780.4**	**563.6**	**311.3**	**311.3**	**993.3**	**717.4**
Net Result ($000s / wk)	**(1,247)**	**(1,247)**	**(1,491)**	**(1,400)**	**(1,537)**	**(1,537)**	**(1,782)**	**(1,690)**	**(1,207)**	**(1,207)**	**(1,098)**	**(1,142)**
Cost/Load Handled	*($2,687)*	*($2,687)*	*($1,067)*	*($1,277)*	*($3,228)*	*($3,228)*	*($1,203)*	*($1,466)*	*($2,265)*	*($2,265)*	*($982)*	*($1,209)*
Rev/Load	*$364*	*$364*	*$367*	*$367*	*$364*	*$364*	*$367*	*$367*	*$464*	*$464*	*$467*	*$467*
Net/Load	*($2,322)*	*($2,322)*	*($700)*	*($910)*	*($2,863)*	*($2,863)*	*($837)*	*($1,099)*	*($1,801)*	*($1,801)*	*($516)*	*($742)*

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 1		<= Cap	Assumed Util.			<= Cap	Assumed Util.			<= Cap	Assumed Util.	
VslClass vsl11	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%
011 - ATB 14 kt Cont/RoRo	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Distribution of Costs - Opt 1, Vessel 11												
VesselCapital $/day	$21,460											
Crew & Oper.	$13,960											
Vsl Sum $/Day	$35,420											
$/Voy	$178.58											
$/week/vsl	$247.94											
$/week	$495.88											
Cost per week												
Vessel Capital	300.4	300.4	300.4	300.4	507.1	507.1	507.1	507.1	393.3	393.3	393.3	393.3
Vessel Crew & Operating	195.4	195.4	195.4	195.4	195.4	195.4	195.4	195.4	195.4	195.4	195.4	195.4
Fuel	418.6	418.6	418.6	418.6	502.3	502.3	502.3	502.3	418.6	418.6	418.6	418.6
Port Call Cost	192.7	192.7	192.7	192.7	192.7	192.7	192.7	192.7	192.7	192.7	192.7	192.7
Service Management	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Subtotal Vessel	1,162.1	1,162.1	1,162.1	1,162.1	1,452.4	1,452.4	1,452.4	1,452.4	1,254.9	1,254.9	1,254.9	1,254.9
Handling	253.3	253.3	1,003.3	724.6	253.3	253.3	1,003.3	724.6	230.2	230.2	730.0	527.2
HMT	26.8	26.8	106.5	76.9	26.8	26.8	106.5	76.9	33.5	33.5	106.5	76.9
Total Costs/week	1,442.2	1,442.2	2,271.8	1,963.6	1,732.5	1,732.5	2,562.2	2,253.9	1,518.6	1,518.6	2,091.3	1,859.0
% of Weekly Costs												
Vessel Capital	20.8%	20.8%	13.2%	15.3%	29.3%	29.3%	19.8%	22.5%	25.9%	25.9%	18.8%	21.2%
Vessel Crew & Operating	13.6%	13.6%	8.6%	10.0%	11.3%	11.3%	7.6%	8.7%	12.9%	12.9%	9.3%	10.5%
Fuel	29.0%	29.0%	18.4%	21.3%	29.0%	29.0%	19.6%	22.3%	27.6%	27.6%	20.0%	22.5%
Port Call Cost	13.4%	13.4%	8.5%	9.8%	11.1%	11.1%	7.5%	8.5%	12.7%	12.7%	9.2%	10.4%
Service Management	3.8%	3.8%	2.4%	2.8%	3.2%	3.2%	2.1%	2.4%	3.6%	3.6%	2.6%	3.0%
Subtotal Vessel	80.6%	80.6%	51.2%	59.2%	83.8%	83.8%	56.7%	64.4%	82.6%	82.6%	60.0%	67.5%
Handling	17.6%	17.6%	44.2%	36.9%	14.6%	14.6%	39.2%	32.1%	15.2%	15.2%	34.9%	28.4%
HMT	1.9%	1.9%	4.7%	3.9%	1.5%	1.5%	4.2%	3.4%	2.2%	2.2%	5.1%	4.1%
Total Costs/week	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Service Option 2

Service Option #2
Port Rotation: **NYNJ - Miami - Port Canaveral - NYNJ**

Southbound Volumes: Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	$/Unit Loading	$/Unit Discharge	Handling $000s/ Week	Rate Per Unit	Rev per Week
									ILA Costs				
NYNJ	NYNY	Miami	Miami	494	25%	20	6,175	118.8	300	190	58,212	1,242	147,550
NYNJ	NYNY	Orlando	Canaveral	184	25%	20	2,300	44.2	300	190	21,658	1,242	54,896
NYNJ	NYNY	Tampa	Canaveral	281	25%	20	3,513	67.5	300	190	33,075	1,242	83,835
NYNJ	NYNY	Jacksonville	Canaveral	46		20	-	0	300	190	-	1,242	-
NYNJ	NYNJ	Miami	Miami	277	25%	20	3,463	66.6	300	190	32,634	1,242	82,717
NYNJ	NYNJ	Orlando	Canaveral	94	25%	20	1,175	22.6	300	190	11,074	1,242	28,069
NYNJ	NYNJ	Tampa	Canaveral	86	25%	20	1,075	20.7	300	190	10,143	1,242	25,709
NYNJ	NYNJ	Jacksonville	Canaveral	48		20	-	0	300	190	-	1,242	-
NYNJ	Phil NJ	Miami	Miami	222	0%	20	-	0	300	190	-	1,242	-
NYNJ	Phil NJ	Orlando	Canaveral	22	0%	20	-	0	300	190	-	1,242	-
NYNJ	Phil NJ	Tampa	Canaveral	27	0%	20	-	0	300	190	-	1,242	-
NYNJ	Phil NJ	Jacksonville	Canaveral	6	0%	20	-	0	300	190	-	1,242	-
Southbound Total				1787			17,700	340			166,796		422,777
Canaveral	Jacksonville	NYNJ	NYNJ	23		20	-	0	190	300	-	945	-
Canaveral	Orlando	NYNJ	NYNJ	38	25%	20	475	9.1	190	300	4,459	945	8,600
Canaveral	Tampa	NYNJ	NYNJ	53	25%	20	663	12.7	190	300	6,223	945	12,002
Miami	Miami	NYNJ	NYNJ	62	25%	20	775	14.9	190	300	7,301	945	14,081
Canaveral	Jacksonville	NYNY	NYNJ	16		20	-	0	190	300	-	945	-
Canaveral	Orlando	NYNY	NYNJ	73	25%	20	913	17.5	190	300	8,575	945	16,538
Canaveral	Tampa	NYNY	NYNJ	186	25%	20	2,325	44.7	190	300	21,903	945	42,242
Miami	Miami	NYNY	NYNJ	140	25%	20	1,750	33.7	190	300	16,513	945	31,847
Canaveral	Jacksonville	Phil NJ	NYNJ	2	0%	20	-	0	190	300	-	945	-
Canaveral	Orlando	Phil NJ	NYNJ	2	0%	20	-	0	190	300	-	945	-
Canaveral	Tampa	Phil NJ	NYNJ	2	0%	20	-	0	190	300	-	945	-
Miami	Miami	Phil NJ	NYNJ	7	0%	20	-	0	190	300	-	945	-
Northbound Total				604			6,900	133			64,974		125,307
Grand Total Loads							**24,600**	**473**			**231,770**		**548,084**
Per Load											$490		$1,159

Service Recap

Voy Option	Cap - Units Per Voy	Voy Days	Vsl Voy Costs	Vsl wn/Op	Fuel Costs	Port Calls	Avg Speed
a) 7day, vsl 04	314	7.0	748	404.6	273.4	69.7	16.6
b) 7day, vsl 01	151	7.0	620	333.5	216.7	69.7	16.6

Sensitivities:	**Base Case:**	**Alternate Case:** Unfavorable	**Alternate Case:** Favorable
Fuel Cost (MDO/MGO)	$1,025 per ton	$1,230 per ton	$1,025 per ton
Vsl Mortgage Rate	6%	8%	6%
Return on Vessel Equity	8%	18%	8%
Handling Cost	ILA Costs	ILA Costs	Reduced Costs
Cargo Density	20 ton/Ld	20 ton/Ld	16 ton/Ld
Local Port Dray Cost	$ 300 Per Local Port Dray	300 Per Local Port Dray	200 Per Local Port Dray

Service Option 2 – Vessel 4 – Ro-Ro Med 20kt

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 2		<= Cap ı Assumed Util.				<= Cap ı Assumed Util.				<= Cap Assumed Util.		
vsl04	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**
04-RoRo Med 20kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Own&Oper Cost	404.6	404.6			482.8	482.8			404.6	404.6		
Fuel Cost	273.4	273.4			328.1	328.1			273.4	273.4		
Port Call Cost	69.7	69.7			69.7	69.7			69.7	69.7		
Total Cost/Voy	747.7	747.7			880.6	880.6			747.7	747.7		
Voy Duration	7.0	7.0			7.0	7.0			7.0	7.0		
Ships Deployed	2.0	2.0			2.0	2.0			2.0	2.0		
Voy/wk	2.0	2.0			2.0	2.0			2.0	2.0		
Vessel Service Cost/wk	1495.4	1495.4			1761.2	1761.2			1495.4	1495.4		
Service Mgmnt/wk	55.0	55.0			55.0	55.0			55.0	55.0		
Subtotal - FixedCost/wk	1550.4	1550.4	1550.4	1550.4	1816.2	1816.2	1816.2	1816.2	1550.4	1550.4	1550.4	1550.4
1-way Cap/Voy (100%)	255	255	255	255	255	255	255	255	255	255	255	255
1-way Cap/wk (100%)	510	510	510	510	510	510	510	510	510	510	510	510
SB Lds/wk	340	340	459	332	340	340	459	332	425	425	459	332
NB Ld/wk	133	133	459	332	133	133	459	332	166	166	459	332
Total Lds/wk	473	473	918	663	473	473	918	663	591	591	918	663
Utilization SB	67%	67%	90%	65%	67%	67%	90%	65%	83%	83%	90%	65%
NB	26%	26%	90%	65%	26%	26%	90%	65%	33%	33%	90%	65%
Average	46%	46%	90%	65%	46%	46%	90%	65%	58%	58%	90%	65%
SB Handling $000s/wk	166.8	166.8	224.9	162.4	166.8	166.8	224.9	162.4	151.0	151.0	162.9	117.7
NB Handling $000s/wk	65.0	65.0	224.9	162.4	65.0	65.0	224.9	162.4	58.9	58.9	162.9	117.7
HMT/wk 50	23.7	23.7	45.9	33.2	23.7	23.7	45.9	33.2	29.6	29.6	45.9	33.2
Subtotal VarCost/wk ($000s)	255.4	255.4	495.7	358.0	255.4	255.4	495.7	358.0	239.4	239.4	371.8	268.5
Avg Var Cost / Load		*540*	*540*	*540*		*540*	*540*	*540*		*405*	*405*	*405*
Grand Total Costs/wk ($000s)	**1,806**	**1,806**	**2,046**	**1,908**	**2,072**	**2,072**	**2,312**	**2,174**	**1,790**	**1,790**	**1,922**	**1,819**
SB Rev $/wk	422.8	422.8	570.1	411.7	422.8	422.8	570.1	411.7	528.2	528.2	570.1	411.7
NB Rev $/wk	125.3	125.3	433.8	313.3	125.3	125.3	433.8	313.3	156.7	156.7	433.8	313.3
SubTotal Rev/wk ($000s)	**548.1**	**548.1**	**1,003.8**	**725.0**	**548.1**	**548.1**	**1,003.8**	**725.0**	**684.9**	**684.9**	**1,003.8**	**725.0**
Net Result ($000s / wk)	**(1,258)**	**(1,258)**	**(1,042)**	**(1,183)**	**(1,523)**	**(1,523)**	**(1,308)**	**(1,449)**	**(1,105)**	**(1,105)**	**(918)**	**(1,094)**
Cost/Load Handled	*($3,818)*	*($3,818)*	*($2,229)*	*($2,878)*	*($4,380)*	*($4,380)*	*($2,518)*	*($3,279)*	*($3,028)*	*($3,028)*	*($2,094)*	*($2,743)*
Rev/Load	*$1,159*	*$1,159*	*$1,094*	*$1,094*	*$1,159*	*$1,159*	*$1,094*	*$1,094*	*$1,159*	*$1,159*	*$1,094*	*$1,094*
Net/Load	*($2,659)*	*($2,659)*	*($1,135)*	*($1,785)*	*($3,221)*	*($3,221)*	*($1,425)*	*($2,186)*	*($1,869)*	*($1,869)*	*($1,000)*	*($1,650)*
Breakeven Ratio (Rev / Cost)	*30%*	*30%*	*49%*	*38%*	*26%*	*26%*	*43%*	*33%*	*38%*	*38%*	*52%*	*40%*

Service Option 2 – Vessel 4 – Ro-Ro Med 20kt (cont'd)

		Base Case				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 2			<= Cap ı Assumed Util.				<= Cap ı Assumed Util.				<= Cap Assumed Util.		
vsl04		25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%	25% Mkt	Limit of	90%	65%
04-RoRo Med 20kt		Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Distribution of Costs - Opt 2, Vessel 4													
VesselCapital	$/day	$38,590											
Crew & Oper.	$/day	$19,210											
Total Vsl Cost	$/day	$57,800											
Total Vsl Cost	$/Voy	$404,600											
Total Vsl Cost	$/week/vsl	$404,600											
Total Vsl Cost	$/week	$809,200											
Cost per week													
Vessel Capital		540.3	540.3	540.3	540.3	493.5	493.5	493.5	493.5	380.1	380.1	380.1	380.1
Vessel Crew & Operating		268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9
Fuel		546.9	546.9	546.9	546.9	656.3	656.3	656.3	656.3	546.9	546.9	546.9	546.9
Port Call Cost		139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3
Service Management		215.1	215.1	215.1	215.1	258.1	258.1	258.1	258.1	215.1	215.1	215.1	215.1
Subtotal Vessel		1,710.5	1,710.5	1,710.5	1,710.5	1,816.2	1,816.2	1,816.2	1,816.2	1,550.4	1,550.4	1,550.4	1,550.4
Handling		231.8	231.8	449.8	324.9	231.8	231.8	449.8	324.9	209.8	209.8	325.9	235.4
HMT		23.7	23.7	45.9	33.2	23.7	23.7	45.9	33.2	29.6	29.6	45.9	33.2
Total Costs/week		1,965.9	1,965.9	2,206.2	2,068.5	2,047.9	2,071.6	2,311.9	2,174.2	1,760.2	1,789.8	1,922.2	1,818.9
% of Weekly Costs													
Vessel Capital		27.5%	27.5%	24.5%	26.1%	24.1%	23.8%	21.3%	22.7%	21.6%	21.2%	19.8%	20.9%
Vessel Crew & Operating		13.7%	13.7%	12.2%	13.0%	13.1%	13.0%	11.6%	12.4%	15.3%	15.0%	14.0%	14.8%
Fuel		27.8%	27.8%	24.8%	26.4%	32.0%	31.7%	28.4%	30.2%	31.1%	30.6%	28.5%	30.1%
Port Call Cost		7.1%	7.1%	6.3%	6.7%	6.8%	6.7%	6.0%	6.4%	7.9%	7.8%	7.2%	7.7%
Service Management		10.9%	10.9%	9.8%	10.4%	12.6%	12.5%	11.2%	11.9%	12.2%	12.0%	11.2%	11.8%
Subtotal Vessel		87.0%	87.0%	77.5%	82.7%	88.7%	87.7%	78.6%	83.5%	88.1%	86.6%	80.7%	85.2%
Handling		11.8%	11.8%	20.4%	15.7%	11.3%	11.2%	19.5%	14.9%	11.9%	11.7%	17.0%	12.9%
HMT		1.2%	1.2%	2.1%	1.6%	1.2%	1.1%	2.0%	1.5%	1.7%	1.7%	2.4%	1.8%
Total Costs/week		100.0%	100.0%	100.0%	100.0%	101.2%	100.0%	100.0%	100.0%	101.7%	100.0%	100.0%	100.0%
Cost Per Load													
Loads Per Week		473	473	918	663	473	473	918	663	591	591	918	663
Vessel Capital		1,142	1,142	589	815	1,043	1,043	538	744	643	643	414	573
Vessel Crew & Operating		569	569	293	406	569	569	293	406	455	455	293	406
Fuel		1,156	1,156	596	825	1,387	1,387	715	990	925	925	596	825
Port Call Cost		295	295	152	210	295	295	152	210	236	236	152	210
Service Management		455	455	234	324	546	546	281	389	364	364	234	324
Subtotal Vessel		3,616	3,616	1,863	2,580	3,840	3,840	1,978	2,739	2,623	2,623	1,689	2,338
Handling		490	490	490	490	490	490	490	490	355	355	355	355
HMT		50	50	50	50	50	50	50	50	50	50	50	50
Total Costs/Load		**4,156**	**4,156**	**2,403**	**3,120**	**4,330**	**4,380**	**2,518**	**3,279**	**2,978**	**3,028**	**2,094**	**2,743**

Service Option 2 – Vessel 1 – Ro-Ro Small 18kt

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 2		<= Cap \ Assumed Util.				<= Cap \ Assumed Util.				<= Cap Assumed Util.		
vsl01	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%	25% Mkt	Limit of	90%	65%
01-RoRo Small 18kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Own&Oper Cost	333.5	333.5			392.7	392.7			333.5	333.5		
Fuel Cost	216.7	216.7			260.0	260.0			216.7	216.7		
Port Call Cost	69.7	69.7			69.7	69.7			69.7	69.7		
Total Cost/Voy	619.8	619.8			722.4	722.4			619.8	619.8		
Voy Duration	7.0	7.0			7.0	7.0			7.0	7.0		
Ships Deployed	2.0	2.0			2.0	2.0			2.0	2.0		
Voy/wk	2.0	2.0			2.0	2.0			2.0	2.0		
Vessel Service Cost/wk	1239.6	1239.6			1444.7	1444.7			1239.6	1239.6		
Service Mgmnt/wk	55.0	55.0			55.0	55.0			55.0	55.0		
Subtotal - FixedCost/wk ($000s)	1294.6	1294.6	1294.6	1294.6	1499.7	1499.7	1499.7	1499.7	1294.6	1294.6	1294.6	1294.6
1-way Cap/Voy (100%)	151	151	151	151	151	151	151	151	151	151	151	151
1-way Cap/wk (100%)	302	302	302	302	302	302	302	302	302	302	302	302
SB Lds/wk	340	272	272	196	340	272	272	196	425	272	272	196
NB Ld/wk	133	133	272	196	133	133	272	196	166	166	272	196
Total Lds/wk	473	404	544	393	473	404	544	393	591	438	544	393
Utilization SB	113%	90%	90%	65%	113%	90%	90%	65%	141%	90%	90%	65%
NB	44%	44%	90%	65%	44%	44%	90%	65%	55%	55%	90%	65%
Average	78%	67%	90%	65%	78%	67%	90%	65%	98%	72%	90%	65%
SB Handling $000s/wk	166.8	133.2	133.2	96.2	166.8	133.2	133.2	96.2	151.0	96.5	96.5	69.7
NB Handling $000s/wk	65.0	65.0	133.2	96.2	65.0	65.0	133.2	96.2	58.9	58.9	96.5	69.7
HMT/wk 50	23.7	20.2	27.2	19.6	23.7	20.2	27.2	19.6	29.6	21.9	27.2	19.6
Subtotal VarCost/wk ($000s)	255.4	218.4	293.5	212.0	255.4	218.4	293.5	212.0	239.4	177.2	220.2	159.0
Avg Var Cost / Load		*540*	*540*	*540*		*540*	*540*	*540*		*405*	*405*	*405*
Grand Total Costs/wk ($000s)	**1,550**	**1,513**	**1,588**	**1,507**	**1,755**	**1,718**	**1,793**	**1,712**	**1,534**	**1,472**	**1,515**	**1,454**
SB Rev/wk	422.8	337.6	337.6	243.8	422.8	337.6	337.6	243.8	528.2	337.6	337.6	243.8
NB Rev/wk	125.3	125.3	256.9	185.5	125.3	125.3	256.9	185.5	156.7	156.7	256.9	185.5
SubTotal Rev/wk ($000s)	**548.1**	**462.9**	**594.4**	**429.3**	**548.1**	**462.9**	**594.4**	**429.3**	**684.9**	**494.3**	**594.4**	**429.3**
Net Result ($000s / wk)	**(1,002)**	**(1,050)**	**(994)**	**(1,077)**	**(1,207)**	**(1,255)**	**(1,199)**	**(1,282)**	**(849)**	**(978)**	**(920)**	**(1,024)**
Cost/Load Handled	*($3,277)*	*($3,741)*	*($2,922)*	*($3,838)*	*($3,711)*	*($4,249)*	*($3,299)*	*($4,360)*	*($2,595)*	*($3,363)*	*($2,787)*	*($3,703)*
Rev/Load	*$1,159*	*$1,145*	*$1,094*	*$1,094*	*$1,159*	*$1,145*	*$1,094*	*$1,094*	*$1,159*	*$1,129*	*$1,094*	*$1,094*
Net/Load	*($2,118)*	*($2,597)*	*($1,828)*	*($2,744)*	*($2,552)*	*($3,104)*	*($2,205)*	*($3,267)*	*($1,437)*	*($2,234)*	*($1,693)*	*($2,609)*
Breakeven Ratio (Rev / Cost)	*35%*	*31%*	*37%*	*28%*	*31%*	*27%*	*33%*	*25%*	*45%*	*34%*	*39%*	*30%*

Service Option 2 – Vessel 1 – Ro-Ro Small 18kt (cont'd)

	Base Case				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 2		<= Cap ı Assumed Util.				<= Cap ı Assumed Util.				<= Cap Assumed Util.		
vsl01	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%	25% Mkt	Limit of	90%	65%
01-RoRo Small 18kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Distribution of Costs - Opt 2, Vessel 01												
VesselCapital $/day	$29,230											
Crew & Oper. $/day	$18,410											
Total Vsl Cost $/day	$47,640											
Total Vsl Cost $/Voy	$333,480											
Total Vsl Cost $/week/vsl	$333,480											
Total Vsl Cost $/week	$666,960											
Cost per week												
Vessel Capital	409.2	409.2	409.2	409.2	582.7	582.7	582.7	582.7	464.2	464.2	464.2	464.2
Vessel Crew & Operating	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7
Fuel	433.3	433.3	433.3	433.3	520.0	520.0	520.0	520.0	433.3	433.3	433.3	433.3
Port Call Cost	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3
Service Management	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Vessel	1,239.6	1,239.6	1,239.6	1,239.6	1,499.7	1,499.7	1,499.7	1,499.7	1,294.6	1,294.6	1,294.6	1,294.6
Handling	231.8	198.2	266.4	192.4	231.8	198.2	266.4	192.4	209.8	155.3	193.0	139.4
HMT	23.7	20.2	27.2	19.6	23.7	20.2	27.2	19.6	29.6	21.9	27.2	19.6
Total Costs/week	1,495.0	1,458.0	1,533.2	1,451.6	1,731.5	1,718.1	1,793.3	1,711.7	1,504.5	1,471.9	1,514.8	1,453.6
% of Weekly Costs												
Vessel Capital	27.4%	28.1%	26.7%	28.2%	33.7%	33.9%	32.5%	34.0%	30.9%	31.5%	30.6%	31.9%
Vessel Crew & Operating	17.2%	17.7%	16.8%	17.8%	14.9%	15.0%	14.4%	15.1%	17.1%	17.5%	17.0%	17.7%
Fuel	29.0%	29.7%	28.3%	29.9%	30.0%	30.3%	29.0%	30.4%	28.8%	29.4%	28.6%	29.8%
Port Call Cost	9.3%	9.6%	9.1%	9.6%	8.0%	8.1%	7.8%	8.1%	9.3%	9.5%	9.2%	9.6%
Service Management	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Subtotal Vessel	82.9%	85.0%	80.9%	85.4%	86.6%	87.3%	83.6%	87.6%	86.1%	88.0%	85.5%	89.1%
Handling	15.5%	13.6%	17.4%	13.3%	13.4%	11.5%	14.9%	11.2%	13.9%	10.6%	12.7%	9.6%
HMT	1.6%	1.4%	1.8%	1.4%	1.4%	1.2%	1.5%	1.1%	2.0%	1.5%	1.8%	1.4%
Total Costs/week	100.0%	100.0%	100.0%	100.0%	101.4%	100.0%	100.0%	100.0%	102.0%	100.0%	100.0%	100.0%
Cost Per Load												
Loads Per Week	473	404	544	393	473	404	544	393	591	438	544	393
Vessel Capital	865	1,012	753	1,042	1,232	1,441	1,072	1,484	785	1,061	854	1,182
Vessel Crew & Operating	545	637	474	656	545	637	474	656	436	589	474	656
Fuel	916	1,072	797	1,104	1,099	1,286	957	1,325	733	990	797	1,104
Port Call Cost	295	345	256	355	295	345	256	355	236	318	256	355
Service Management	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal Vessel	2,621	3,065	2,280	3,157	3,171	3,709	2,759	3,820	2,190	2,958	2,382	3,298
Handling	490	490	490	490	490	490	490	490	355	355	355	355
HMT	50	50	50	50	50	50	50	50	50	50	50	50
Total Costs/Load	**3,161**	**3,605**	**2,820**	**3,697**	**3,661**	**4,249**	**3,299**	**4,360**	**2,545**	**3,363**	**2,787**	**3,703**

Service Option 2 – Vessel 21 – Container Feeder 18kt

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable				
Service Option 2	<= Cap ו Assumed Util.				<= Cap ו Assumed Util.				<= Cap Assumed Util.				
vsl21	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%	25% Mkt	Limit of	90%	65%	
21-Cont Feeder 18 kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili	
Own&Oper Cost	270.6	270.6			311.3	311.3			270.6	270.6			
Fuel Cost	197.3	197.3			236.8	236.8			197.3	197.3			
Port Call Cost	69.7	69.7			69.7	69.7			69.7	69.7			
Total Cost/Voy	537.5	537.5			617.7	617.7			537.5	537.5			
Voy Duration	7.0	7.0			7.0	7.0			7.0	7.0			
Ships Deployed	2.0	2.0			2.0	2.0			2.0	2.0			
Voy/wk	2.0	2.0			2.0	2.0			2.0	2.0			
Vessel Service Cost/wk	1075.0	1075.0			1235.4	1235.4			1075.0	1075.0			
Service Mgmnt/wk	55.0	55.0			55.0	55.0			55.0	55.0			
Subtotal - FixedCost/wk	1130.0	1130.0	1130.0	1130.0	1290.4	1290.4	1290.4	1290.4	1130.0	1130.0	1130.0	1130.0	
1-way max/Voy (100%)	392	392	392	392	392	392	392	392	392	392	392	392	
1-way Cap/wk (100%)	784	784	784	784	784	784	784	784	784	784	784	784	
SB Lds/wk	340	340	706	510	340	340	706	510	425	425	706	510	
NB Ld/wk	133	133	706	510	133	133	706	510	166	166	706	510	
Total Lds/wk	473	473	1,411	1,019	473	473	1,411	1,019	591	591	1,411	1,019	
Utilization SB	43%	43%	90%	65%	43%	43%	90%	65%	54%	54%	90%	65%	
NB	17%	17%	90%	65%	17%	17%	90%	65%	21%	21%	90%	65%	
Average	30%	30%	90%	65%	30%	30%	90%	65%	38%	38%	90%	65%	
SB Handling $000s/wk	194.0	194.0	402.2	290.5	194.0	194.0	402.2	290.5	185.0	185.0	306.9	221.7	LoLo
NB Handling $000s/wk	75.6	75.6	402.2	290.5	75.6	75.6	402.2	290.5	72.1	72.1	306.9	221.7	Xtra$/Box
HMT/wk 50	23.7	23.7	70.6	51.0	23.7	23.7	70.6	51.0	29.6	29.6	70.6	51.0	$80
Subtotal VarCost/wk ($000s)	293.3	293.3	874.9	631.9	293.3	293.3	874.9	631.9	286.7	286.7	684.4	494.3	
Avg Var Cost / Load	*620*	*620*	*620*	*620*	*620*	*620*	*620*	*620*	*485*	*485*	*485*	*485*	
Grand Total Costs/wk ($000s)	**1,423**	**1,423**	**2,005**	**1,762**	**1,584**	**1,584**	**2,165**	**1,922**	**1,417**	**1,417**	**1,814**	**1,624**	
SB Rev/wk	422.8	422.8	876.4	632.9	422.8	422.8	876.4	632.9	528.2	528.2	876.4	632.9	
NB Rev/wk	125.3	125.3	666.8	481.6	125.3	125.3	666.8	481.6	156.7	156.7	666.8	481.6	
SubTotal Rev/wk ($000s)	**548.1**	**548.1**	**1,543.1**	**1,114.5**	**548.1**	**548.1**	**1,543.1**	**1,114.5**	**684.9**	**684.9**	**1,543.1**	**1,114.5**	
Net Result ($000s / wk)	**(875)**	**(875)**	**(462)**	**(647)**	**(1,036)**	**(1,036)**	**(622)**	**(808)**	**(732)**	**(732)**	**(271)**	**(510)**	
Cost/Load Handled	*($3,009)*	*($3,009)*	*($1,421)*	*($1,729)*	*($3,348)*	*($3,348)*	*($1,534)*	*($1,886)*	*($2,397)*	*($2,397)*	*($1,286)*	*($1,594)*	
Rev/Load	*$1,159*	*$1,159*	*$1,094*	*$1,094*	*$1,159*	*$1,159*	*$1,094*	*$1,094*	*$1,159*	*$1,159*	*$1,094*	*$1,094*	
Net/Load	*($1,850)*	*($1,850)*	*($327)*	*($635)*	*($2,189)*	*($2,189)*	*($441)*	*($793)*	*($1,238)*	*($1,238)*	*($192)*	*($500)*	
Breakeven Ratio (Rev / Cost)	*39%*	*39%*	*77%*	*63%*	*35%*	*35%*	*71%*	*58%*	*48%*	*48%*	*85%*	*69%*	

Service Option 2 – Vessel 21 – Container Feeder 18kt (cont'd)

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 2		<= Cap ı Assumed Util.				<= Cap ı Assumed Util.				<= Cap Assumed Util.		
vsl21	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%	25% Mkt	Limit of	90%	65%
21-Cont Feeder 18 kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Distribution of Costs - Opt 2, Vessel 21												
VesselCapital $/day	$20,110											
Crew & Oper. $/day	$18,540											
Total Vsl Cost $/day	$38,650											
Total Vsl Cost $/Voy	$270,550											
Total Vsl Cost $/week/vsl	$270,550											
Total Vsl Cost $/week	$541,100											
Cost per week												
Vessel Capital	281.5	281.5	281.5	281.5	363.0	363.0	363.0	363.0	281.5	281.5	281.5	281.5
Vessel Crew & Operating	259.6	259.6	259.6	259.6	259.6	259.6	259.6	259.6	259.6	259.6	259.6	259.6
Fuel	394.6	394.6	394.6	394.6	473.5	473.5	473.5	473.5	394.6	394.6	394.6	394.6
Port Call Cost	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3
Service Management	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Subtotal Vessel	1,130.0	1,130.0	1,130.0	1,130.0	1,290.4	1,290.4	1,290.4	1,290.4	1,130.0	1,130.0	1,130.0	1,130.0
Handling	269.6	269.6	804.4	580.9	269.6	269.6	804.4	580.9	257.1	257.1	613.9	443.4
HMT	23.7	23.7	70.6	51.0	23.7	23.7	70.6	51.0	29.6	29.6	70.6	51.0
Total Costs/week	1,423.3	1,423.3	2,005.0	1,761.9	1,560.0	1,583.7	2,165.3	1,922.3	1,387.1	1,416.7	1,814.4	1,624.3
% of Weekly Costs												
Vessel Capital	19.8%	19.8%	14.0%	16.0%	23.3%	22.9%	16.8%	18.9%	20.3%	19.9%	15.5%	17.3%
Vessel Crew & Operating	18.2%	18.2%	12.9%	14.7%	16.6%	16.4%	12.0%	13.5%	18.7%	18.3%	14.3%	16.0%
Fuel	27.7%	27.7%	19.7%	22.4%	30.4%	29.9%	21.9%	24.6%	28.4%	27.9%	21.7%	24.3%
Port Call Cost	9.8%	9.8%	6.9%	7.9%	8.9%	8.8%	6.4%	7.2%	10.0%	9.8%	7.7%	8.6%
Service Management	3.9%	3.9%	2.7%	3.1%	3.5%	3.5%	2.5%	2.9%	4.0%	3.9%	3.0%	3.4%
Subtotal Vessel	79.4%	79.4%	56.4%	64.1%	82.7%	81.5%	59.6%	67.1%	81.5%	79.8%	62.3%	69.6%
Handling	18.9%	18.9%	40.1%	33.0%	17.3%	17.0%	37.1%	30.2%	18.5%	18.1%	33.8%	27.3%
HMT	1.7%	1.7%	3.5%	2.9%	1.5%	1.5%	3.3%	2.7%	2.1%	2.1%	3.9%	3.1%
Total Costs/week	100.0%	100.0%	100.0%	100.0%	101.5%	100.0%	100.0%	100.0%	102.1%	100.0%	100.0%	100.0%
Cost Per Load												
Loads Per Week	473	473	1,411	1,019	473	473	1,411	1,019	591	591	1,411	1,019
Vessel Capital	595	595	200	276	767	767	257	356	476	476	200	276
Vessel Crew & Operating	549	549	184	255	549	549	184	255	439	439	184	255
Fuel	834	834	280	387	1,001	1,001	336	465	668	668	280	387
Port Call Cost	295	295	99	137	295	295	99	137	236	236	99	137
Service Management	116	116	39	54	116	116	39	54	93	93	39	54
Subtotal Vessel	2,389	2,389	801	1,109	2,728	2,728	914	1,266	1,912	1,912	801	1,109
Handling	570	570	570	570	570	570	570	570	435	435	435	435
HMT	50	50	50	50	50	50	50	50	50	50	50	50
Total Costs/Load	**3,009**	**3,009**	**1,421**	**1,729**	**3,298**	**3,348**	**1,534**	**1,886**	**2,347**	**2,397**	**1,286**	**1,594**

Service Option 2 – Vessel 12 – Ro-Con Large 18kt

	BASE CASE				Alt Case: Unfavorable				Alt Case: Favorable				
Service Option 2		<= Cap \ Assumed Util.				<= Cap \ Assumed Util.				<= Cap Assumed Util.			
vsl12	25% Mkt	Limit of	90%	65%	25% Mkt	Limit of	90%	65%	25% Mkt	Limit of	90%	65%	
12-Rocon Large 18kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili	
Own&Oper Cost	409.4	409.4			489.0	489.0			409.4	409.4			
Fuel Cost	215.1	215.1			258.1	258.1			215.1	215.1			
Port Call Cost	69.7	69.7			69.7	69.7			69.7	69.7			
Total Cost/Voy	694.2	694.2			816.8	816.8			694.2	694.2			
Voy Duration	7.0	7.0			7.0	7.0			7.0	7.0			
Ships Deployed	2.0	2.0			2.0	2.0			2.0	2.0			
Voy/wk	2.0	2.0			2.0	2.0			2.0	2.0			
Vessel Service Cost/wk	1388.4	1388.4			1633.6	1633.6			1388.4	1388.4			
Service Mgmnt/wk	55.0	55.0			55.0	55.0			55.0	55.0			
Subtotal - FixedCost/wk	1443.4	1443.4	1443.4	1443.4	1688.6	1688.6	1688.6	1688.6	1443.4	1443.4	1443.4	1443.4	
1-way max/Voy (100%)	414	414	414	414	414	414	414	414	414	414	414	414	
1-way Cap/wk (100%)	828	828	828	828	828	828	828	828	828	828	828	828	
SB Lds/wk	340	340	745	538	340	340	745	538	425	425	745	538	
NB Ld/wk	133	133	745	538	133	133	745	538	166	166	745	538	
Total Lds/wk	473	473	1,490	1,076	473	473	1,490	1,076	591	591	1,490	1,076	
Utilization SB	41%	41%	90%	65%	41%	41%	90%	65%	51%	51%	90%	65%	
NB	16%	16%	90%	65%	16%	16%	90%	65%	20%	20%	90%	65%	
Average	29%	29%	90%	65%	29%	29%	90%	65%	36%	36%	90%	65%	
SB Handling $000s/wk	194.0	194.0	424.8	306.8	194.0	194.0	424.8	306.8	185.0	185.0	324.2	234.1	LoLo
NB Handling $000s/wk	75.6	75.6	424.8	306.8	75.6	75.6	424.8	306.8	72.1	72.1	324.2	234.1	Xtra$/Box
HMT/wk 50	23.7	23.7	74.5	53.8	23.7	23.7	74.5	53.8	29.6	29.6	74.5	53.8	$80
Subtotal VarCost/wk ($000s)	293.3	293.3	924.0	667.4	293.3	293.3	924.0	667.4	286.7	286.7	722.8	522.1	
Avg Var Cost / Load	*620*	*620*	*620*	*620*	*620*	*620*	*620*	*620*	*485*	*485*	*485*	*485*	
Grand Total Costs/wk ($000s)	**1,737**	**1,737**	**2,367**	**2,111**	**1,982**	**1,982**	**2,613**	**2,356**	**1,730**	**1,730**	**2,166**	**1,965**	
SB Rev/wk	422.8	422.8	925.5	668.4	422.8	422.8	925.5	668.4	528.2	528.2	925.5	668.4	
NB Rev/wk	125.3	125.3	704.2	508.6	125.3	125.3	704.2	508.6	156.7	156.7	704.2	508.6	
SubTotal Rev/wk ($000s)	**548.1**	**548.1**	**1,629.8**	**1,177.0**	**548.1**	**548.1**	**1,629.8**	**1,177.0**	**684.9**	**684.9**	**1,629.8**	**1,177.0**	
Net Result ($000s / wk)	**(1,189)**	**(1,189)**	**(738)**	**(934)**	**(1,434)**	**(1,434)**	**(983)**	**(1,179)**	**(1,045)**	**(1,045)**	**(537)**	**(788)**	
Cost/Load Handled	*($3,672)*	*($3,672)*	*($1,588)*	*($1,961)*	*($4,190)*	*($4,190)*	*($1,753)*	*($2,189)*	*($2,927)*	*($2,927)*	*($1,453)*	*($1,826)*	
Rev/Load	*$1,159*	*$1,159*	*$1,094*	*$1,094*	*$1,159*	*$1,159*	*$1,094*	*$1,094*	*$1,159*	*$1,159*	*$1,094*	*$1,094*	
Net/Load	*($2,513)*	*($2,513)*	*($495)*	*($867)*	*($3,031)*	*($3,031)*	*($660)*	*($1,095)*	*($1,768)*	*($1,768)*	*($360)*	*($732)*	
Breakeven Ratio (Rev / Cost)	*32%*	*32%*	*69%*	*56%*	*28%*	*28%*	*62%*	*50%*	*40%*	*40%*	*75%*	*60%*	

Service Option 2 – Vessel 12 – Ro-Con Large 18kt (cont'd)

		Base Case				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 2			<= Cap ı Assumed Util.				<= Cap ı Assumed Util.				<= Cap Assumed Util.		
vsl12		25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%	25% Mkt	Limit of	90%	65%
12-Rocon Large 18kt		Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Distribution of Costs - Opt 2, Vessel 12													
VesselCapital	$/day	$39,280											
Crew & Oper.	$/day	$19,210											
	$/day	$58,490											
	$/Voy	$409,430											
	$/week/vsl	$409,430											
	$/week	$818,860											
Cost per week													
Vessel Capital		549.9	549.9	549.9	549.9	709.1	709.1	709.1	709.1	549.9	549.9	549.9	549.9
Vessel Crew & Operating		268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9
Fuel		430.2	430.2	430.2	430.2	516.3	516.3	516.3	516.3	430.2	430.2	430.2	430.2
Port Call Cost		139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3
Service Management		55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Subtotal Vessel		1,443.4	1,443.4	1,443.4	1,443.4	1,688.6	1,688.6	1,688.6	1,688.6	1,443.4	1,443.4	1,443.4	1,443.4
Handling		269.6	269.6	849.5	613.5	269.6	269.6	849.5	613.5	257.1	257.1	648.3	468.2
HMT		23.7	23.7	74.5	53.8	23.7	23.7	74.5	53.8	29.6	29.6	74.5	53.8
Total Costs/week		1,736.7	1,736.7	2,367.5	2,110.8	1,958.3	1,981.9	2,612.7	2,356.0	1,700.5	1,730.1	2,166.3	1,965.5
% of Weekly Costs													
Vessel Capital		31.7%	31.7%	23.2%	26.1%	36.2%	35.8%	27.1%	30.1%	32.3%	31.8%	25.4%	28.0%
Vessel Crew & Operating		15.5%	15.5%	11.4%	12.7%	13.7%	13.6%	10.3%	11.4%	15.8%	15.5%	12.4%	13.7%
Fuel		24.8%	24.8%	18.2%	20.4%	26.4%	26.1%	19.8%	21.9%	25.3%	24.9%	19.9%	21.9%
Port Call Cost		8.0%	8.0%	5.9%	6.6%	7.1%	7.0%	5.3%	5.9%	8.2%	8.1%	6.4%	7.1%
Service Management		3.2%	3.2%	2.3%	2.6%	2.8%	2.8%	2.1%	2.3%	3.2%	3.2%	2.5%	2.8%
Subtotal Vessel		83.1%	83.1%	61.0%	68.4%	86.2%	85.2%	64.6%	71.7%	84.9%	83.4%	66.6%	73.4%
Handling		15.5%	15.5%	35.9%	29.1%	13.8%	13.6%	32.5%	26.0%	15.1%	14.9%	29.9%	23.8%
HMT		1.4%	1.4%	3.1%	2.5%	1.2%	1.2%	2.9%	2.3%	1.7%	1.7%	3.4%	2.7%
Total Costs/week		100.0%	100.0%	100.0%	100.0%	101.2%	100.0%	100.0%	100.0%	101.7%	100.0%	100.0%	100.0%
Cost Per Load													
Loads Per Week		473	473	1,490	1,076	473	473	1,490	1,076	591	591	1,490	1,076
Vessel Capital		1,163	1,163	369	511	1,499	1,499	476	659	930	930	369	511
Vessel Crew & Operating		569	569	180	250	569	569	180	250	455	455	180	250
Fuel		910	910	289	400	1,092	1,092	346	480	728	728	289	400
Port Call Cost		295	295	93	129	295	295	93	129	236	236	93	129
Service Management		116	116	37	51	116	116	37	51	93	93	37	51
Subtotal Vessel		3,052	3,052	968	1,341	3,570	3,570	1,133	1,569	2,442	2,442	968	1,341
Handling		570	570	570	570	570	570	570	570	435	435	435	435
HMT		50	50	50	50	50	50	50	50	50	50	50	50
Total Costs/Load		**3,672**	**3,672**	**1,588**	**1,961**	**4,140**	**4,190**	**1,753**	**2,189**	**2,877**	**2,927**	**1,453**	**1,826**

Service Option 3

Service Option #3
Port Rotation: **Del River - Miami - Port Canaveral - Del River**

Southbound Volumes: Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	$/Unit Loading	$/Unit Discharge	Handling $000s/ Week	Rate Per Unit	Revenue Per Week
									ILA Costs				
Del River	Phil NJ	Miami	Miami	222	25%	20	2,775	53.4	230	190	22,428	1,170	62,478
Del River	Phil NJ	Orlando	Canaveral	22	25%	20	275	5.3	230	190	2,226	1,170	6,201
Del River	Phil NJ	Tampa	Canaveral	27	25%	20	338	6.5	230	190	2,730	1,170	7,605
Del River	Phil NJ	Jacksonville	Canaveral	6		20	-	0	230	190	-	1,170	-
Del River	Phil	Miami	Miami	186	25%	20	2,325	44.7	230	190	18,774	1,170	52,299
Del River	Phil	Orlando	Canaveral	73	25%	20	913	17.5	230	190	7,350	1,170	20,475
Del River	Phil	Tampa	Canaveral	28	25%	20	350	6.7	230	190	2,814	1,170	7,839
Del River	Phil	Jacksonville	Canaveral	21		20	-	0	230	190	-	1,170	-
Del River	NYNJ	Miami	Miami	277	0%	20	-	0	230	190	-	1,170	-
Del River	NYNJ	Orlando	Canaveral	94	0%	20	-	0	230	190	-	1,170	-
Del River	NYNJ	Tampa	Canaveral	86	0%	20	-	0	230	190	-	1,170	-
Del River	NYNJ	Jacksonville	Canaveral	48	0%	20	-	0	230	190	-	1,170	-
Southbound Total				1090			6,975	134			56,322		156,897
Canaveral	Jacksonville	Phil NJ	Del River	2		20	-	0	190	230	-	945	-
Canaveral	Orlando	Phil NJ	Del River	2	25%	20	25	0.5	190	230	210	945	473
Canaveral	Tampa	Phil NJ	Del River	2	25%	20	25	0.5	190	230	210	945	473
Miami	Miami	Phil NJ	Del River	7	25%	20	88	1.7	190	230	714	945	1,607
Canaveral	Jacksonville	Phil	Del River	18		20	-	0	190	230	-	945	-
Canaveral	Orlando	Phil	Del River	9	25%	20	113	2.2	190	230	924	945	2,079
Canaveral	Tampa	Phil	Del River	47	25%	20	588	11.3	190	230	4,746	945	10,679
Miami	Miami	Phil	Del River	263	25%	20	3,288	63.2	190	230	26,544	945	59,724
Canaveral	Jacksonville	NYNJ	Del River	23	0%	20	-	0	190	230	-	945	-
Canaveral	Orlando	NYNJ	Del River	38	0%	20	-	0	190	230	-	945	-
Canaveral	Tampa	NYNJ	Del River	53	0%	20	-	0	190	230	-	945	-
Miami	Miami	NYNJ	Del River	62	0%	20	-	0	190	230	-	945	-
Northbound Total				526		240	4125	79			33,348		75,033
Grand Total Loads							**11,100**	**214**			**89,670**		**231,930**
Per Load											$420		$1,086

Service Recap

Voy Option	Cap - Units Per Voy	Voy Days	Vsl Voy Costs	Vsl Own/Op	Fuel Costs	Port Calls	Avg Speed
a) 7day, vsl 04	314	7.0	724	404.6	251.6	67.5	16.2
a) 7day, vsl 01	151	7.0	594	333.5	199.7	60.9	16.2

Sensitivities:	**Base Case:**	**Alternate Case:** Unfavorable	**Alternate Case:** Favorable
Fuel Cost (MDO/MGO)	$1,025 per ton	$1,230 per ton	$1,025 per ton
Vsl Mortgage Rate	6%	8%	6%
Return on Vessel Equity	8%	18%	8%
Handling Cost	ILA Costs	ILA Costs	Reduced Costs
Cargo Density	20 ton/Ld	20 ton/Ld	16 ton/Ld
Local Port Dray Cost	$ 300 Per Local Port Dray	$ 300 Per Local Port Dray	$ 200 Per Local Port Dray

Service Option 3 – Vessel 4 – Ro-Ro Med 20kt

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 3		<= Cap	Assumed Util.			<= Cap	Assumed Util.			<= Cap	Assumed Util.	
vsl04	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**
04-RoRo Med 20kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Own&Oper Cost	404.6	404.6			482.8	482.8			404.6	404.6		
Fuel Cost	251.6	251.6			302.0	302.0			251.6	251.6		
Port Call Cost	67.5	67.5			67.5	67.5			67.5	67.5		
Total Cost/Voy	723.7	723.7			852.2	852.2			723.7	723.7		
Voy Duration	7.0	7.0			7.0	7.0			7.0	7.0		
Ships Deployed	2.0	2.0			2.0	2.0			2.0	2.0		
Voy/wk	2.0	2.0			2.0	2.0			2.0	2.0		
Vessel Service Cost/wk	1447.4	1447.4			1704.4	1704.4			1447.4	1447.4		
Service Mgmnt/wk	55.0	55.0			55.0	55.0			55.0	55.0		
Subtotal - FixedCost/wk	1502.4	1502.4	1502.4	1502.4	1759.4	1759.4	1759.4	1759.4	1502.4	1502.4	1502.4	1502.4
1-way Cap/Voy (100%)	314	314	314	314	314	314	314	314	314	314	314	314
1-way Cap/wk (100%)	628	628	628	628	628	628	628	628	628	628	628	628
SB Lds/wk	134	134	565	408	134	134	565	408	168	168	565	408
NB Ld/wk	79	79	565	408	79	79	565	408	99	99	565	408
Total Lds/wk	214	214	1,130	816	214	214	1,130	816	267	267	1,130	816
Utilization SB	21%	21%	90%	65%	21%	21%	90%	65%	27%	27%	90%	65%
NB	13%	13%	90%	65%	13%	13%	90%	65%	16%	16%	90%	65%
Average	17%	17%	90%	65%	17%	17%	90%	65%	21%	21%	90%	65%
SB Handling $000s/wk	56.3	56.3	237.4	171.4	56.3	56.3	237.4	171.4	50.3	50.3	169.6	122.5
NB Handling $000s/wk	33.3	33.3	237.4	171.4	33.3	33.3	237.4	171.4	29.7	29.7	169.6	122.5
HMT/wk 50	10.7	10.7	56.5	40.8	10.7	10.7	56.5	40.8	13.3	13.3	56.5	40.8
Subtotal VarCost/wk ($000s)	100.3	100.3	531.3	383.7	100.3	100.3	531.3	383.7	93.3	93.3	395.6	285.7
Avg Var Cost / Load	*470*	*470*	*470*	*470*	*470*	*470*	*470*	*470*	*350*	*350*	*350*	*350*
Grand Total Costs/wk ($000s)	**1,603**	**1,603**	**2,034**	**1,886**	**1,860**	**1,860**	**2,291**	**2,143**	**1,596**	**1,596**	**1,898**	**1,788**
SB Rev $/wk	156.9	156.9	661.3	477.6	156.9	156.9	661.3	477.6	196.1	196.1	661.3	477.6
NB Rev $/wk	75.0	75.0	534.1	385.7	75.0	75.0	534.1	385.7	93.6	93.6	534.1	385.7
SubTotal Rev/wk ($000s)	**231.9**	**231.9**	**1,195.4**	**863.3**	**231.9**	**231.9**	**1,195.4**	**863.3**	**289.7**	**289.7**	**1,195.4**	**863.3**
Net Result ($000s / wk)	**(1,371)**	**(1,371)**	**(838)**	**(1,023)**	**(1,628)**	**(1,628)**	**(1,095)**	**(1,280)**	**(1,306)**	**(1,306)**	**(703)**	**(925)**
Cost/Load Handled	*($7,507)*	*($7,507)*	*($1,799)*	*($2,310)*	*($8,711)*	*($8,711)*	*($2,026)*	*($2,625)*	*($5,983)*	*($5,983)*	*($1,679)*	*($2,190)*
Rev/Load	*$1,086*	*$1,086*	*$1,058*	*$1,058*	*$1,086*	*$1,086*	*$1,058*	*$1,058*	*$1,086*	*$1,086*	*$1,058*	*$1,058*
Net/Load	*($6,421)*	*($6,421)*	*($742)*	*($1,253)*	*($7,624)*	*($7,624)*	*($969)*	*($1,568)*	*($4,897)*	*($4,897)*	*($622)*	*($1,133)*
Breakeven Ratio (Rev / Cost)	*14%*	*14%*	*59%*	*46%*	*12%*	*12%*	*52%*	*40%*	*18%*	*18%*	*63%*	*48%*

Service Option 3 – Vessel 4 – Ro-Ro Med 20kt (cont'd)

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 3		<= Cap ı Assumed Util.				<= Cap ɔ Assumed Util.				<= Cap Assumed Util.		
vsl04	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**
04-RoRo Med 20kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Distribution of Costs - Opt 3, Vessel 04												
VesselCapital $/day	$38,590											
Crew & Oper. $/day	$19,210											
$/day	$57,800											
$/Voy	$404,600											
$/week/vsl	$404,600											
$/week	$809,200											
Cost per week												
Vessel Capital	540.3	540.3	540.3	540.3	696.6	696.6	696.6	696.6	540.3	540.3	540.3	540.3
Vessel Crew & Operating	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9
Fuel	503.3	503.3	503.3	503.3	603.9	603.9	603.9	603.9	503.3	503.3	503.3	503.3
Port Call Cost	134.9	134.9	134.9	134.9	134.9	134.9	134.9	134.9	134.9	134.9	134.9	134.9
Service Management	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Subtotal Vessel	1,502.4	1,502.4	1,502.4	1,502.4	1,759.4	1,759.4	1,759.4	1,759.4	1,502.4	1,502.4	1,502.4	1,502.4
Handling	89.7	89.7	474.8	342.9	89.7	89.7	474.8	342.9	80.0	80.0	339.1	244.9
HMT	10.7	10.7	56.5	40.8	10.7	10.7	56.5	40.8	13.3	13.3	56.5	40.8
Total Costs/week	1,602.7	1,602.7	2,033.7	1,886.1	1,859.8	1,859.8	2,290.7	2,143.1	1,595.7	1,595.7	1,898.0	1,788.1
% of Weekly Costs												
Vessel Capital	33.7%	33.7%	26.6%	28.6%	37.5%	37.5%	30.4%	32.5%	33.9%	33.9%	28.5%	30.2%
Vessel Crew & Operating	16.8%	16.8%	13.2%	14.3%	14.5%	14.5%	11.7%	12.5%	16.9%	16.9%	14.2%	15.0%
Fuel	31.4%	31.4%	24.7%	26.7%	32.5%	32.5%	26.4%	28.2%	31.5%	31.5%	26.5%	28.1%
Port Call Cost	8.4%	8.4%	6.6%	7.2%	7.3%	7.3%	5.9%	6.3%	8.5%	8.5%	7.1%	7.5%
Service Management	3.4%	3.4%	2.7%	2.9%	3.0%	3.0%	2.4%	2.6%	3.4%	3.4%	2.9%	3.1%
Subtotal Vessel	93.7%	93.7%	73.9%	79.7%	94.6%	94.6%	76.8%	82.1%	94.2%	94.2%	79.2%	84.0%
Handling	5.6%	5.6%	23.3%	18.2%	4.8%	4.8%	20.7%	16.0%	5.0%	5.0%	17.9%	13.7%
HMT	0.7%	0.7%	2.8%	2.2%	0.6%	0.6%	2.5%	1.9%	0.8%	0.8%	3.0%	2.3%
Total Costs/week	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cost Per Load												
Loads Per Week	214	214	1,130	816	214	214	1,130	816	267	267	1,130	816
Vessel Capital	2,530	2,530	478	662	3,263	3,263	616	853	2,026	2,026	478	662
Vessel Crew & Operating	1,260	1,260	238	329	1,260	1,260	238	329	1,008	1,008	238	329
Fuel	2,357	2,357	445	616	2,829	2,829	534	740	1,887	1,887	445	616
Port Call Cost	632	632	119	165	632	632	119	165	506	506	119	165
Service Management	258	258	49	67	258	258	49	67	206	206	49	67
Subtotal Vessel	7,037	7,037	1,329	1,840	8,241	8,241	1,556	2,155	5,633	5,633	1,329	1,840
Handling	420	420	420	420	420	420	420	420	300	300	300	300
HMT	50	50	50	50	50	50	50	50	50	50	50	50
Total Costs/Load	**7,507**	**7,507**	**1,799**	**2,310**	**8,711**	**8,711**	**2,026**	**2,625**	**5,983**	**5,983**	**1,679**	**2,190**

Service Option 3 – Vessel 1 – Ro-Ro Small 18kt

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 3		<= Cap	With Assumed Util.			<= Cap	With Assumed Util.			<= Cap	With Assumed Util.	
vsl01	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%	25% Mkt	Limit of	90%	65%
01-RoRo Small 18kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Own&Oper Cost	333.5	333.5			392.7	392.7			333.5	333.5		
Fuel Cost	199.7	199.7			239.6	239.6			199.7	199.7		
Port Call Cost	60.9	60.9			60.9	60.9			60.9	60.9		
Total Cost/Voy	594.1	594.1			693.2	693.2			594.1	594.1		
Voy Duration	7.0	7.0			7.0	7.0			7.0	7.0		
Ships Deployed	2.0	2.0			2.0	2.0			2.0	2.0		
Voy/wk	2.0	2.0			2.0	2.0			2.0	2.0		
Vessel Service Cost/wk	1188.2	1188.2			1386.5	1386.5			1188.2	1188.2		
Service Mgmnt/wk	55.0	55.0			55.0	55.0			55.0	55.0		
Subtotal - FixedCost/wk ($000s	1243.2	1243.2	1243.2	1243.2	1441.5	1441.5	1441.5	1441.5	1243.2	1243.2	1243.2	1243.2
1-way Cap/Voy (100%)	151	151	151	151	151	151	151	151	151	151	151	151
1-way Cap/wk (100%)	302	302	302	302	302	302	302	302	302	302	302	302
SB Lds/wk	134	134	272	196	134	134	272	196	168	168	272	196
NB Ld/wk	79	79	272	196	79	79	272	196	99	99	272	196
Total Lds/wk	214	214	544	393	214	214	544	393	267	267	544	393
Utilization SB	44%	44%	90%	65%	44%	44%	90%	65%	55%	55%	90%	65%
NB	26%	26%	90%	65%	26%	26%	90%	65%	33%	33%	90%	65%
Average	35%	35%	90%	65%	35%	35%	90%	65%	44%	44%	90%	65%
SB Handling $000s/wk	56.3	56.3	114.2	82.4	56.3	56.3	114.2	82.4	50.3	50.3	81.5	58.9
NB Handling $000s/wk	33.3	33.3	114.2	82.4	33.3	33.3	114.2	82.4	29.7	29.7	81.5	58.9
HMT/wk 50	10.7	10.7	27.2	19.6	10.7	10.7	27.2	19.6	13.3	13.3	27.2	19.6
Subtotal VarCost/wk ($000s)	100.3	100.3	255.5	184.5	100.3	100.3	255.5	184.5	93.3	93.3	190.3	137.4
Avg Var Cost / Load	*470*	*470*	*470*	*470*	*470*	*470*	*470*	*470*	*350*	*350*	*350*	*350*
Grand Total Costs/wk ($000s)	**1,344**	**1,344**	**1,499**	**1,428**	**1,542**	**1,542**	**1,697**	**1,626**	**1,337**	**1,337**	**1,433**	**1,381**
SB Rev/wk	156.9	156.9	318.0	229.7	156.9	156.9	318.0	229.7	196.1	196.1	318.0	229.7
NB Rev/wk	75.0	75.0	256.9	185.5	75.0	75.0	256.9	185.5	93.6	93.6	256.9	185.5
SubTotal Rev/wk ($000s)	**231.9**	**231.9**	**574.9**	**415.2**	**231.9**	**231.9**	**574.9**	**415.2**	**289.7**	**289.7**	**574.9**	**415.2**
Net Result ($000s / wk)	**(1,112)**	**(1,112)**	**(924)**	**(1,013)**	**(1,310)**	**(1,310)**	**(1,122)**	**(1,211)**	**(1,047)**	**(1,047)**	**(859)**	**(965)**
Cost/Load Handled	*($6,293)*	*($6,293)*	*($2,757)*	*($3,636)*	*($7,222)*	*($7,222)*	*($3,122)*	*($4,142)*	*($5,011)*	*($5,011)*	*($2,637)*	*($3,516)*
Rev/Load	*$1,086*	*$1,086*	*$1,058*	*$1,058*	*$1,086*	*$1,086*	*$1,058*	*$1,058*	*$1,086*	*$1,086*	*$1,058*	*$1,058*
Net/Load	*($5,206)*	*($5,206)*	*($1,699)*	*($2,579)*	*($6,135)*	*($6,135)*	*($2,064)*	*($3,084)*	*($3,925)*	*($3,925)*	*($1,579)*	*($2,459)*
Breakeven Ratio (Rev / Cost)	*17%*	*17%*	*38%*	*29%*	*15%*	*15%*	*34%*	*26%*	*22%*	*22%*	*40%*	*30%*

Service Option 3 – Vessel 1 – Ro-Ro Small 18kt (cont'd)

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 3		<= Cap ı Assumed Util.				<= Cap ɔ Assumed Util.				<= Cap Assumed Util.		
vsl01	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**
01-RoRo Small 18kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Distribution of Costs - Opt 3, Vessel 01												
VesselCapital $/day	$29,230											
Crew & Oper. $/day	$18,410											
$/day	$47,640											
$/Voy	$333,480											
$/week/vsl	$333,480											
$/week	$666,960											
Cost per week												
Vessel Capital	409.2	409.2	409.2	409.2	527.7	527.7	527.7	527.7	409.2	409.2	409.2	409.2
Vessel Crew & Operating	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7	257.7
Fuel	399.4	399.4	399.4	399.4	479.3	479.3	479.3	479.3	399.4	399.4	399.4	399.4
Port Call Cost	121.8	121.8	121.8	121.8	121.8	121.8	121.8	121.8	121.8	121.8	121.8	121.8
Service Management	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Subtotal Vessel	1,243.2	1,243.2	1,243.2	1,243.2	1,441.5	1,441.5	1,441.5	1,441.5	1,243.2	1,243.2	1,243.2	1,243.2
Handling	89.7	89.7	228.3	164.9	89.7	89.7	228.3	164.9	80.0	80.0	163.1	117.8
HMT	10.7	10.7	27.2	19.6	10.7	10.7	27.2	19.6	13.3	13.3	27.2	19.6
Total Costs/week	1,343.5	1,343.5	1,498.7	1,427.7	1,541.8	1,541.8	1,697.0	1,626.0	1,336.5	1,336.5	1,433.4	1,380.6
% of Weekly Costs												
Vessel Capital	30.5%	30.5%	27.3%	28.7%	34.2%	34.2%	31.1%	32.5%	30.6%	30.6%	28.5%	29.6%
Vessel Crew & Operating	19.2%	19.2%	17.2%	18.1%	16.7%	16.7%	15.2%	15.9%	19.3%	19.3%	18.0%	18.7%
Fuel	29.7%	29.7%	26.7%	28.0%	31.1%	31.1%	28.2%	29.5%	29.9%	29.9%	27.9%	28.9%
Port Call Cost	9.1%	9.1%	8.1%	8.5%	7.9%	7.9%	7.2%	7.5%	9.1%	9.1%	8.5%	8.8%
Service Management	4.1%	4.1%	3.7%	3.9%	3.6%	3.6%	3.2%	3.4%	4.1%	4.1%	3.8%	4.0%
Subtotal Vessel	92.5%	92.5%	83.0%	87.1%	93.5%	93.5%	84.9%	88.7%	93.0%	93.0%	86.7%	90.0%
Handling	6.7%	6.7%	15.2%	11.5%	5.8%	5.8%	13.5%	10.1%	6.0%	6.0%	11.4%	8.5%
HMT	0.8%	0.8%	1.8%	1.4%	0.7%	0.7%	1.6%	1.2%	1.0%	1.0%	1.9%	1.4%
Total Costs/week	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cost Per Load												
Loads Per Week	214	214	544	393	214	214	544	393	267	267	544	393
Vessel Capital	1,917	1,917	753	1,042	2,471	2,471	971	1,344	1,534	1,534	753	1,042
Vessel Crew & Operating	1,207	1,207	474	656	1,207	1,207	474	656	966	966	474	656
Fuel	1,871	1,871	735	1,017	2,245	2,245	882	1,221	1,498	1,498	735	1,017
Port Call Cost	570	570	224	310	570	570	224	310	457	457	224	310
Service Management	258	258	101	140	258	258	101	140	206	206	101	140
Subtotal Vessel	5,823	5,823	2,287	3,166	6,752	6,752	2,652	3,672	4,661	4,661	2,287	3,166
Handling	420	420	420	420	420	420	420	420	300	300	300	300
HMT	50	50	50	50	50	50	50	50	50	50	50	50
Total Costs/Load	**6,293**	**6,293**	**2,757**	**3,636**	**7,222**	**7,222**	**3,122**	**4,142**	**5,011**	**5,011**	**2,637**	**3,516**

Service Option 3 – Vessel 21 – Container Feeder 18kt

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable				
Service Option 3		<= Cap	With Assumed Util.			<= Cap	With Assumed Util.			<= Cap	With Assumed Util.		
vsl21	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	90%	65%	25% Mkt	Limit of	90%	65%	
21-Cont Feeder 18 kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili	
Own&Oper Cost	270.6	270.6			311.3	311.3			270.6	270.6			
Fuel Cost	181.5	181.5			217.8	217.8			181.5	181.5			
Port Call Cost	69.7	69.7			69.7	69.7			69.7	69.7			
Total Cost/Voy	521.7	521.7			598.8	598.8			521.7	521.7			
Voy Duration	7.0	7.0			7.0	7.0			7.0	7.0			
Ships Deployed	2.0	2.0			2.0	2.0			2.0	2.0			
Voy/wk	2.0	2.0			2.0	2.0			2.0	2.0			
Vessel Service Cost/wk	1043.4	1043.4			1197.5	1197.5			1043.4	1043.4			
Service Mgmnt/wk	55.0	55.0			55.0	55.0			55.0	55.0			
Subtotal - FixedCost/wk	1098.4	1098.4	1098.4	1098.4	1252.5	1252.5	1252.5	1252.5	1098.4	1098.4	1098.4	1098.4	
1-way max/Voy (100%)	392	392	392	392	392	392	392	392	392	392	392	392	
1-way Cap/wk (100%)	784	784	784	784	784	784	784	784	784	784	784	784	
SB Lds/wk	134	134	706	510	134	134	706	510	168	168	706	510	
NB Ld/wk	79	79	706	510	79	79	706	510	99	99	706	510	
Total Lds/wk	214	214	1,411	1,019	214	214	1,411	1,019	267	267	1,411	1,019	
Utilization SB	17%	17%	90%	65%	17%	17%	90%	65%	21%	21%	90%	65%	
NB	10%	10%	90%	65%	10%	10%	90%	65%	13%	13%	90%	65%	
Average	14%	14%	90%	65%	14%	14%	90%	65%	17%	17%	90%	65%	
SB Handling $000s/wk	67.1	67.1	352.8	254.8	59.0	59.0	310.2	224.0	63.7	63.7	268.1	193.6	LoLo
NB Handling $000s/wk	39.7	39.7	352.8	254.8	34.9	34.9	310.2	224.0	37.7	37.7	268.1	193.6	Xtra$/Box
HMT/wk 50	10.7	10.7	70.6	51.0	10.7	10.7	70.6	51.0	13.3	13.3	70.6	51.0	$80
Subtotal VarCost/wk ($000s)	117.4	117.4	776.2	560.6	104.5	104.5	691.0	499.0	114.7	114.7	606.8	438.3	
Avg Var Cost / Load	*550*	*550*	*550*	*550*	*490*	*490*	*490*	*490*	*430*	*430*	*430*	*430*	
Grand Total Costs/wk ($000s)	**1,216**	**1,216**	**1,875**	**1,659**	**1,357**	**1,357**	**1,943**	**1,752**	**1,213**	**1,213**	**1,705**	**1,537**	
SB Rev/wk	156.9	156.9	825.6	596.2	156.9	156.9	825.6	596.2	196.1	196.1	825.6	596.2	
NB Rev/wk	75.0	75.0	666.8	481.6	75.0	75.0	666.8	481.6	93.6	93.6	666.8	481.6	
SubTotal Rev/wk ($000s)	**231.9**	**231.9**	**1,492.3**	**1,077.8**	**231.9**	**231.9**	**1,492.3**	**1,077.8**	**289.7**	**289.7**	**1,492.3**	**1,077.8**	
Net Result ($000s / wk)	**(984)**	**(984)**	**(382)**	**(581)**	**(1,125)**	**(1,125)**	**(451)**	**(674)**	**(923)**	**(923)**	**(213)**	**(459)**	
Cost/Load Handled	*($5,695)*	*($5,695)*	*($1,328)*	*($1,628)*	*($6,356)*	*($6,356)*	*($1,377)*	*($1,719)*	*($4,549)*	*($4,549)*	*($1,208)*	*($1,508)*	
Rev/Load	*$1,086*	*$1,086*	*$1,058*	*$1,058*	*$1,086*	*$1,086*	*$1,058*	*$1,058*	*$1,086*	*$1,086*	*$1,058*	*$1,058*	
Net/Load	*($4,609)*	*($4,609)*	*($271)*	*($570)*	*($5,270)*	*($5,270)*	*($320)*	*($661)*	*($3,462)*	*($3,462)*	*($151)*	*($450)*	
Breakeven Ratio (Rev / Cost)	*19%*	*19%*	*80%*	*65%*	*17%*	*17%*	*77%*	*62%*	*24%*	*24%*	*88%*	*70%*	

Service Option 3 – Vessel 21 – Container Feeder 18kt (cont'd)

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 3		<= Cap ı Assumed Util.				<= Cap ı Assumed Util.				<= Cap Assumed Util.		
vsl21	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**
21-Cont Feeder 18 kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Distribution of Costs - Opt 3, Vessel21												
VesselCapital $/day	$20,110											
Crew & Oper. $/day	$18,540											
$/day	$38,650											
$/Voy	$270,550											
$/week/vsl	$270,550											
$/week	$541,100											
Cost per week												
Vessel Capital	281.5	281.5	281.5	281.5	363.0	363.0	363.0	363.0	281.5	281.5	281.5	281.5
Vessel Crew & Operating	259.6	259.6	259.6	259.6	259.6	259.6	259.6	259.6	259.6	259.6	259.6	259.6
Fuel	363.0	363.0	363.0	363.0	435.6	435.6	435.6	435.6	363.0	363.0	363.0	363.0
Port Call Cost	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3
Service Management	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Subtotal Vessel	1,098.4	1,098.4	1,098.4	1,098.4	1,252.5	1,252.5	1,252.5	1,252.5	1,098.4	1,098.4	1,098.4	1,098.4
Handling	106.8	106.8	705.6	509.6	93.9	93.9	620.4	448.1	101.3	101.3	536.3	387.3
HMT	10.7	10.7	70.6	51.0	10.7	10.7	70.6	51.0	13.3	13.3	70.6	51.0
Total Costs/week	1,215.9	1,215.9	1,874.6	1,659.0	1,357.1	1,357.1	1,943.5	1,751.6	1,213.1	1,213.1	1,705.3	1,536.7
% of Weekly Costs												
Vessel Capital	23.2%	23.2%	15.0%	17.0%	26.8%	26.8%	18.7%	20.7%	23.2%	23.2%	16.5%	18.3%
Vessel Crew & Operating	21.3%	21.3%	13.8%	15.6%	19.1%	19.1%	13.4%	14.8%	21.4%	21.4%	15.2%	16.9%
Fuel	29.9%	29.9%	19.4%	21.9%	32.1%	32.1%	22.4%	24.9%	29.9%	29.9%	21.3%	23.6%
Port Call Cost	11.5%	11.5%	7.4%	8.4%	10.3%	10.3%	7.2%	8.0%	11.5%	11.5%	8.2%	9.1%
Service Management	4.5%	4.5%	2.9%	3.3%	4.1%	4.1%	2.8%	3.1%	4.5%	4.5%	3.2%	3.6%
Subtotal Vessel	90.3%	90.3%	58.6%	66.2%	92.3%	92.3%	64.4%	71.5%	90.5%	90.5%	64.4%	71.5%
Handling	8.8%	8.8%	37.6%	30.7%	6.9%	6.9%	31.9%	25.6%	8.4%	8.4%	31.4%	25.2%
HMT	0.9%	0.9%	3.8%	3.1%	0.8%	0.8%	3.6%	2.9%	1.1%	1.1%	4.1%	3.3%
Total Costs/week	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cost Per Load												
Loads Per Week	214	214	1,411	1,019	214	214	1,411	1,019	267	267	1,411	1,019
Vessel Capital	1,319	1,319	200	276	1,700	1,700	257	356	1,056	1,056	200	276
Vessel Crew & Operating	1,216	1,216	184	255	1,216	1,216	184	255	973	973	184	255
Fuel	1,700	1,700	257	356	2,040	2,040	309	427	1,361	1,361	257	356
Port Call Cost	653	653	99	137	653	653	99	137	522	522	99	137
Service Management	258	258	39	54	258	258	39	54	206	206	39	54
Subtotal Vessel	5,145	5,145	778	1,078	5,867	5,867	888	1,229	4,119	4,119	778	1,078
Handling	500	500	500	500	440	440	440	440	380	380	380	380
HMT	50	50	50	50	50	50	50	50	50	50	50	50
Total Costs/Load	**5,695**	**5,695**	**1,328**	**1,628**	**6,356**	**6,356**	**1,377**	**1,719**	**4,549**	**4,549**	**1,208**	**1,508**

Service Option 3 – Vessel 12 –Ro-Con Large 18kt

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable				
vsl12		<= Cap	Assumed Util.			<= Cap	Assumed Util.			<= Cap	Assumed Util.		
12-Rocon Large 18kt	25% Mkt	Limit of	90%	65%	25% Mkt	Limit of	90%	65%	25% Mkt	Limit of	90%	65%	
VslClass	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili	
Own&Oper Cost	409.4	409.4			489.0	489.0			409.4	409.4			
Fuel Cost	203.9	203.9			244.7	244.7			203.9	203.9			
Port Call Cost	69.7	69.7			69.7	69.7			69.7	69.7			
Total Cost/Voy	683.0	683.0			803.4	803.4			683.0	683.0			
Voy Duration	7.0	7.0			7.0	7.0			7.0	7.0			
Ships Deployed	2.0	2.0			2.0	2.0			2.0	2.0			
Voy/wk	2.0	2.0			2.0	2.0			2.0	2.0			
Vessel Service Cost/wk	1366.0	1366.0			1606.7	1606.7			1366.0	1366.0			
Service Mgmnt/wk	55.0	55.0			55.0	55.0			55.0	55.0			
Subtotal - FixedCost/wk ($000s	1421.0	1421.0	1421.0	1421.0	1661.7	1661.7	1661.7	1661.7	1421.0	1421.0	1421.0	1421.0	
1-way max/Voy (100%)	414	414	414	414	414	414	414	414	414	414	414	414	
1-way Cap/wk (100%)	828	828	828	828	828	828	828	828	828	828	828	828	
SB Lds/wk	134	134	745	538	134	134	745	538	168	168	745	538	
NB Ld/wk	79	79	745	538	79	79	745	538	99	99	745	538	
Total Lds/wk	214	214	1,490	1,076	214	214	1,490	1,076	267	267	1,490	1,076	
Utilization SB	16%	16%	90%	65%	16%	16%	90%	65%	20%	20%	90%	65%	
NB	10%	10%	90%	65%	10%	10%	90%	65%	12%	12%	90%	65%	
Average	13%	13%	90%	65%	13%	13%	90%	65%	16%	16%	90%	65%	
SB Handling/wk	67.1	67.1	372.6	269.1	67.1	67.1	372.6	269.1	63.7	63.7	283.2	204.5	LoLo
NB Handling/wk	39.7	39.7	372.6	269.1	39.7	39.7	372.6	269.1	37.7	37.7	283.2	204.5	Xtra$/Box
HMT/wk $50	10.7	10.7	74.5	53.8	10.7	10.7	74.5	53.8	13.3	13.3	74.5	53.8	$80
Subtotal VarCost/wk ($000s)	117.4	117.4	819.7	592.0	117.4	117.4	819.7	592.0	114.7	114.7	640.9	462.9	
Grand Total Costs/wk ($000s)	**1,538**	**1,538**	**2,241**	**2,013**	**1,779**	**1,779**	**2,481**	**2,254**	**1,536**	**1,536**	**2,062**	**1,884**	
SB Rev/wk	156.9	156.9	871.9	629.7	156.9	156.9	871.9	629.7	196.1	196.1	871.9	629.7	
NB Rev/wk	75.0	75.0	704.2	508.6	75.0	75.0	704.2	508.6	93.6	93.6	704.2	508.6	
SubTotal Rev/wk ($000s)	**231.9**	**231.9**	**1,576.1**	**1,138.3**	**231.9**	**231.9**	**1,576.1**	**1,138.3**	**289.7**	**289.7**	**1,576.1**	**1,138.3**	
Net Result ($000s / wk)	**(1,306)**	**(1,306)**	**(665)**	**(875)**	**(1,547)**	**(1,547)**	**(905)**	**(1,115)**	**(1,246)**	**(1,246)**	**(486)**	**(746)**	
Cost/Load Handled	($7,206)	($7,206)	($1,503)	($1,870)	($8,333)	($8,333)	($1,665)	($2,094)	($5,758)	($5,758)	($1,383)	($1,750)	
Rev/Load	$1,086	$1,086	$1,058	$1,058	$1,086	$1,086	$1,058	$1,058	$1,086	$1,086	$1,058	$1,058	
Net/Load	($6,119)	($6,119)	($446)	($813)	($7,247)	($7,247)	($607)	($1,036)	($4,672)	($4,672)	($326)	($693)	
Breakeven Ratio (Rev / Cost)	*15%*	*15%*	*70%*	*57%*	*13%*	*13%*	*64%*	*51%*	*19%*	*19%*	*76%*	*60%*	

Service Option 3 – Vessel 12 –Ro-Con Large 18kt (cont'd)

	Base Case:				Alt Case: Unfavorable				Alt Case: Favorable			
Service Option 3		<= Cap Assumed Util.				<= Cap Assumed Util.				<= Cap Assumed Util.		
vsl12	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**
12-Rocon Large 18kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Distribution of Costs - Opt 3, Vessel 12												
VesselCapital $/day	$39,280											
Crew & Oper. $/day	$19,210											
$/day	$58,490											
$/Voy	$409,430											
$/week/vsl	$409,430											
$/week	$818,860											
Cost per week												
Vessel Capital	549.9	549.9	549.9	549.9	709.1	709.1	709.1	709.1	549.9	549.9	549.9	549.9
Vessel Crew & Operating	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9
Fuel	407.8	407.8	407.8	407.8	489.4	489.4	489.4	489.4	407.8	407.8	407.8	407.8
Port Call Cost	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3	139.3
Service Management	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0	55.0
Subtotal Vessel	1,421.0	1,421.0	1,421.0	1,421.0	1,661.7	1,661.7	1,661.7	1,661.7	1,421.0	1,421.0	1,421.0	1,421.0
Handling	106.8	106.8	745.2	538.2	106.8	106.8	745.2	538.2	101.3	101.3	566.4	409.0
HMT	10.7	10.7	74.5	53.8	10.7	10.7	74.5	53.8	13.3	13.3	74.5	53.8
Total Costs/week	1,538.4	1,538.4	2,240.7	2,013.0	1,779.2	1,779.2	2,481.5	2,253.8	1,535.7	1,535.7	2,061.9	1,883.8
% of Weekly Costs												
Vessel Capital	35.7%	35.7%	24.5%	27.3%	39.9%	39.9%	28.6%	31.5%	35.8%	35.8%	26.7%	29.2%
Vessel Crew & Operating	17.5%	17.5%	12.0%	13.4%	15.1%	15.1%	10.8%	11.9%	17.5%	17.5%	13.0%	14.3%
Fuel	26.5%	26.5%	18.2%	20.3%	27.5%	27.5%	19.7%	21.7%	26.6%	26.6%	19.8%	21.6%
Port Call Cost	9.1%	9.1%	6.2%	6.9%	7.8%	7.8%	5.6%	6.2%	9.1%	9.1%	6.8%	7.4%
Service Management	3.6%	3.6%	2.5%	2.7%	3.1%	3.1%	2.2%	2.4%	3.6%	3.6%	2.7%	2.9%
Subtotal Vessel	92.4%	92.4%	63.4%	70.6%	93.4%	93.4%	67.0%	73.7%	92.5%	92.5%	68.9%	75.4%
Handling	6.9%	6.9%	33.3%	26.7%	6.0%	6.0%	30.0%	23.9%	6.6%	6.6%	27.5%	21.7%
HMT	0.7%	0.7%	3.3%	2.7%	0.6%	0.6%	3.0%	2.4%	0.9%	0.9%	3.6%	2.9%
Total Costs/week	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cost Per Load												
Loads Per Week	214	214	1,490	1,076	214	214	1,490	1,076	267	267	1,490	1,076
Vessel Capital	2,576	2,576	369	511	3,321	3,321	476	659	2,062	2,062	369	511
Vessel Crew & Operating	1,260	1,260	180	250	1,260	1,260	180	250	1,008	1,008	180	250
Fuel	1,910	1,910	274	379	2,292	2,292	328	455	1,529	1,529	274	379
Port Call Cost	653	653	93	129	653	653	93	129	522	522	93	129
Service Management	258	258	37	51	258	258	37	51	206	206	37	51
Subtotal Vessel	6,656	6,656	953	1,320	7,783	7,783	1,115	1,544	5,328	5,328	953	1,320
Handling	500	500	500	500	500	500	500	500	380	380	380	380
HMT	50	50	50	50	50	50	50	50	50	50	50	50
Total Costs/Load	**7,206**	**7,206**	**1,503**	**1,870**	**8,333**	**8,333**	**1,665**	**2,094**	**5,758**	**5,758**	**1,383**	**1,750**

Service Option 5

Service Option #5 - Coastal Pendulum													
Port Rotation:		Nw Bed - PortInd - Del Riv - Balt - Charl - Wilm - Balt - Nw Bed							(no DelRiver NB call)				
Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	$/Unit Loading	$/Unit Discharge	Handling $000s/ Week	Rate Per Unit	Revenue Per Week
Southbound Volumes:									ILA Costs				
Portland	Maine	Phil NJ	Del River	460	25%	20	5,750	110.6	205	230	48,111	420	46,452
Portland	Maine	Phil	Del River	306	25%	20	3,825	73.6	205	230	32,016	420	30,912
Portland	Maine	Baltimore	Baltimore	62	25%	20	775	14.9	205	295	7,450	555	8,270
Portland	Maine	MD Rem	Baltimore	13	25%	20	163	3.1	205	295	1,550	555	1,721
New Bedford	Boston	Phil NI	Del River	-	25%	20	-	0	205	230	-		
New Bedford	Boston	Phil	Del River	-	25%	20	-	0	205	230	-		
New Bedford	Boston	MD Rem	Baltimore	69	25%	20	863	16.6	205	295	8,300	420	6,972
New Bedford	Boston	Balt	Baltimore	88	25%	20	1,100	21.2	205	295	10,600	420	8,904
New Bedford	MA Rem/RI/CTRem	Phil NI	Del River	-	25%	20	-	0	205	230	-		
New Bedford	MA Rem/RI/CTRem	Phil	Del River	-	25%	20	-	0	205	230	-		
New Bedford	MA Rem/RI/CTRem	MD Rem	Baltimore	36	25%	20	450	8.7	205	295	4,350	420	3,654
New Bedford	MA Rem/RI/CTRem	Balt	Baltimore	43	25%	20	538	10.3	205	295	5,150	420	4,326
		Subtotal North to Central		**1077**			**13,463**	**259**			**117,527**	**3,630**	**111,210**
Del River	Phil NJ	NC Rem	Wilm	123	25%	20	1,538	29.6	230	220	13,320	650	19,240
Del River	Phil NJ	SC Rem	CHS	23	25%	20	288	5.5	230	220	2,475	800	4,400
Del River	Phil NJ	CHS	CHS	3	25%	20	38	0.7	230	220	315	800	560
Del River	Phil	NC Rem	Wilm	1429	25%	20	17,863	343.5	230	220	154,575	650	223,275
Del River	Phil	SC Rem	CHS	95	25%	20	1,188	22.8	230	220	10,260	800	18,240
Del River	Phil	CHS	CHS	9	25%	20	113	2.2	230	220	990	800	1,760
Baltimore	Baltimore	NC Rem	Wilm	0	25%	20	-	0	295	220	-	420	-
Baltimore	Baltimore	SC Rem	CHS	3	25%	20	38	0.7	295	220	361	765	536
Baltimore	Baltimore	CHS	CHS	1	25%	20	13	0.2	295	220	103	765	153
Baltimore	MD Rem	NC Rem	Wilm	0	25%	20	-	0	295	220	-	420	-
Baltimore	MD Rem	SC Rem	CHS	3	25%	20	38	0.7	295	220	361	765	536
Baltimore	MD Rem	CHS	CHS	1	25%	20	13	0.2	295	220	103	765	153
		Subtotal Central to South		**1690**			**21,125**	**406**			**182,862**	**8,400**	**268,852**
Portland	Maine	NC Rem	Wilm	90	25%	20	1,125	21.6	205	220	9,180	1,125	24,300
Portland	Maine	SC Rem	CHS	42	25%	20	525	10.1	205	220	4,293	1,314	13,271
Portland	Maine	CHS	CHS	0	25%	20	-	0	205	220	-	1,314	-
Portland	Maine												
New Bedford	Boston	NC Rem	Wilm	53	25%	20	663	12.7	205	220	5,398	855	10,859
New Bedford	Boston	SC Rem	CHS	20	25%	20	250	4.8	205	220	2,040	990	4,752
New Bedford	Boston	CHS	CHS	6	25%	20	75	1.4	205	220	595	990	1,386
New Bedford	Boston												
New Bedford	MA Rem/RI/CTRem	NC Rem	Wilm	26	25%	20	325	6.3	205	220	2,678	855	5,387
New Bedford	MA Rem/RI/CTRem	SC Rem	CHS	21	25%	20	263	5	205	220	2,125	990	4,950
New Bedford	MA Rem/RI/CTRem	CHS	CHS	3	25%	20	38	0.7	205	220	298	990	693
New Bedford	MA Rem/RI/CTRem												
		Subtotal North to South		**261**			**3,263**	**63**			**26,605**	**9,423**	**65,597**
Southbound Total				**3,028**			**37,850**	**728**			**326,994**	**21,453**	**445,659**
	Ship Utiliz	North to Central						**322**					
		Central to South						**469**					

Service Option 5 (cont'd)

Northbound Volumes

Del River	Phil NJ	Maine	Portland	76	25%	20	950	18.3	230	205	7,961	285	5,216
Del River	Phil NJ	Boston	New Bedford	0	25%	20	-	0	230	205	-		
Del River	Phil NJ	MA Rem/RI/CTI	New Bedford	0	25%	20	-	0	230	205	-		
Del River	Phil	Maine	Portland	127	25%	20	1,588	30.5	230	205	13,268	285	8,693
Del River	Phil	Boston	New Bedford	0	25%	20	-	0	230	205	-		
Del River	Phil	MA Rem/RI/CTI	New Bedford	0	25%	20	-	0	230	205	-		
Baltimore	MD Rem	Maine	Portland	9	25%	20	113	2.2	295	205	1,100	410	902
Baltimore	MD Rem	Boston	New Bedford	79	25%	20	988	19	295	205	9,500	255	4,845
Baltimore	MD Rem	MA Rem/RI/CTI	New Bedford	89	25%	20	1,113	21.4	295	205	10,700	255	5,457
Baltimore	Balt	Maine	Portland	314	25%	20	3,925	75.5	295	205	37,750	410	30,955
Baltimore	Balt	Boston	New Bedford	348	25%	20	4,350	83.7	295	205	41,850	255	21,344
Baltimore	Balt	MA Rem/RI/CTI	New Bedford	113	25%	20	1,413	27.2	295	205	13,600	255	6,936
		Subtotal Central to North		**1155**			**14,438**	**278**			**135,728**	**2,410**	**84,347**
Wilm	NC Rem	Phil NJ	Del River	205		20	-	0	220	230	-	625	-
CHS	SC Rem	Phil NJ	Del River	117		20	-	0	220	230	-	700	-
CHS	CHS	Phil NJ	Del River	8		20	-	0	220	230	-	700	-
Wilm	NC Rem	Phil	Del River	298		20	-	0	220	230	-	625	-
CHS	SC Rem	Phil	Del River	449		20	-	0	220	230	-	700	-
CHS	CHS	Phil	Del River	2		20	-	0	220	230	-	700	-
Wilm	NC Rem	Baltimore	Baltimore	0	25%	20	-	0	220	295	-	225	-
CHS	SC Rem	Baltimore	Baltimore	159	25%	20	1,988	38.2	220	295	19,673	630	24,066
CHS	CHS	Baltimore	Baltimore	3	25%	20	38	0.7	220	295	361	630	441
Wilm	NC Rem	MD Rem	Baltimore	122	25%	20	1,525	29.3	220	295	15,090	225	6,593
CHS	SC Rem	MD Rem	Baltimore	70	25%	20	875	16.8	220	295	8,652	630	10,584
CHS	CHS	MD Rem	Baltimore	6	25%	20	75	1.4	220	295	721	630	882
		Subtotal South to Central		**1439**			**4,500**	**86**			**44,496**	**7,020**	**42,566**
Wilm	NC Rem	Maine	Portland	64	25%	20	800	15.4	220	205	6,545	918	14,137
CHS	SC Rem	Maine	Portland	52	25%	20	650	12.5	220	205	5,313	1,080	13,500

Service Option #5 - Coastal Pendulum

Port Rotation: **Nw Bed - Portlnd - Del Riv - Balt - Charl - Wilm - Balt - Nw Bed** (no DelRiver NB call)

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	$/Unit Loading	$/Unit Discharge	Handling $000s/ Week	Rate Per Unit	Revenue Per Week
CHS	CHS	Maine	Portland	10	25%	20	125	2.4	220	205	1,020	1,080	2,592
Wilm	NC Rem	Boston	New Bedford	349	25%	20	4,363	83.9	220	205	35,658	765	64,184
CHS	SC Rem	Boston	New Bedford	121	25%	20	1,513	29.1	220	205	12,368	885	25,754
CHS	CHS	Boston	New Bedford	46	25%	20	575	11.1	220	205	4,718	885	9,824
Wilm	NC Rem	MA Rem/RI/CTI	New Bedford	104	25%	20	1,300	25	220	205	10,625	765	19,125
CHS	SC Rem	MA Rem/RI/CTI	New Bedford	118	25%	20	1,475	28.4	220	205	12,070	885	25,134
CHS	CHS	MA Rem/RI/CTI	New Bedford	24	25%	20	300	5.8	220	205	2,465	885	5,133
		Subtotal South to North		**888**			**11,100**	**214**			**90,780**	**8,148**	**179,382**
Northbound Total				**3,482**			**30,038**	**578**			**271,004**	**17,578**	**306,294**
	Ship Utiliz	South to Central						**300**					
		Central to North						**491**					
Grand Total Loads							**67,888**	**1,306**			**597,998**		**751,953**
Per Load											$458		$576

Market Capture of 25%	Not Limited By Capacity								
Summary of Cargo Flows	Lds/Wk		On Board		Utiliz.	hand/wk	Cost/ld	Rev/wk	Rev/Ld	Marg/Ld
Subtotal North to Central	259		Dp North	322	0.63	117,527	454	111,210	429	(24)
Subtotal North to South	63					26,605	425	65,597	1,048	623
Subtotal Central to South	406		Dp Central	469	0.92	182,862	450	268,852	662	212
Total Southbound	728	728				326,994	449	445,659	612	163
Subtotal Central to North	278					135,728	489	84,347	304	(185)
Subtotal South to North	214		Dp South	300	0.59	90,780	425	179,382	840	415
Subtotal South to Central	86		Dp Central	491	0.96	44,496	515	42,566	493	(22)
Total Northbound	578	578				271,004	469	306,294	530	61

Service Option 5 (cont'd)

Market Capture of 25%, But Limited By Capacity

Summary of Cargo Flows	Scen Delta	Lds/Wk		On Board	Utiliz.	hand/wk	Cost/ld	Rev/wk	Rev/Ld	Marg/Ld
Subtotal North to Central		259	Dp North	322	0.63	117,527	454	188,910	729	276
Subtotal North to South		63				26,605	425	65,597	1,048	623
Subtotal Central to South	(10)	396	Dp Central	459	0.90	178,359	450	262,232	662	212
Total Southbound	(10)	718				322,491	449	516,739	720.0	270.7
Subtotal Central to North	-30	248				121,071	489	149,578	604	115
Subtotal South to North		214	Dp South	300	0.59	90,780	425	179,382	840	415
Subtotal South to Central		86	Dp Central	461	0.90	44,496	515	51,356	594	79
Total Northbound	(30)	548				256,347	468	380,315	694.3	226.3

Assume 90% Occupancy

Summary of Cargo Flows	Scen Delta	Lds/Wk		On Board	Utiliz.	hand/wk	Cost/ld	Rev/wk	Rev/Ld	Marg/Ld
Subtotal North to Central		259	Dp North	457	0.90	117,527	454	188,910	729	276
Subtotal North to South	135	198				83,980	425	207,061	1,048	623
Subtotal Central to South	(145)	261	Dp Central	459	0.90	117,570	450	172,857	662	212
Total Southbound	(10)	718				319,077	445	568,829	792.6	348.0
Subtotal Central to North	-190	88				42,897	489	52,998	604	115
Subtotal South to North	160	374	Dp South	460	0.90	158,780	425	313,750	840	415
Subtotal South to Central		86	Dp Central	461	0.90	44,496	515	51,356	594	79
Total Northbound	(30)	548				246,173	449	418,104	763.2	313.9

Assume 65% Occupancy

Summary of Cargo Flows	Scen Delta	Lds/Wk		On Board	Utiliz.	hand/wk	Cost/ld	Rev/wk	Rev/Ld	Marg/Ld
Subtotal North to Central		259	Dp North	332	0.65	117,527	454	188,910	729	276
Subtotal North to South	10	73				30,855	425	76,076	1,048	623
Subtotal Central to South	(145)	261	Dp Central	334	0.65	117,570	450	172,857	662	212
Total Southbound	(135)	593				265,952	449	437,843	738.7	290.0
Subtotal Central to North	-190	88				42,897	489	52,998	604	115
Subtotal South to North	30	244	Dp South	330	0.65	103,530	425	204,576	840	415
Subtotal South to Central	-	86	Dp Central	331	0.65	44,496	515	51,356	594	79
Total Northbound	(160)	418				190,923	457	308,929	739.4	282.4

Service Recap	Cap - Units	Voy	Vsl Voy	Vsl	Fuel	Port	Avg
Voy Option	Per Voy	Days	Costs	Own/Op	Costs	Calls	Speed
a) Opt 8 vsl03 7day	255	7.0	902	447.8	334.8	119.5	22.0

Service Option 5 – Vessel 3 –Ro-Ro Medium 24kt

Service Option #5 - Coastal Pendulum

Port Rotation: **Nw Bed - PortInd - Del Riv - Balt - Charl - Wilm - Balt - Nw Bed** (no DelRiver NB call)

Load Port	FAF Origin	FAF Dest	Disch Port	Tons 000s	Capt%	ton/Ld	Lds/Yr	Lds/Wk	$/Unit Loading	$/Unit Discharge	Handling $000s/ Week	Rate Per Unit	Revenue Per Week

Sensitivities:	**Base Case:**		**Alternate Case:**	Unfavorable	**Alternate Case:**	Favorable	
Fuel Cost (MDO/MGO)	$1,025	per ton	$1,230	per ton	$1,025	per ton	
Vsl Mortgage Rate	6%		8%		6%		
Return on Vessel Equity	8%		18%		8%		Affects:
Handling Cost	ILA Costs		ILA Costs		Reduced Costs		Hdlg cost
Cargo Density	20	ton/Ld	20	ton/Ld	16	ton/Ld	vol
Local Port Dray Cost	$ 300	Per Local Port Dray	$ 300	Per Local Port Dray	$ 200	Per Local Port Dray	rev

	Base Case:				**Alt Case: Unfavorable**				**Alt Case: Favorable**			
Service Option 5		<= Cap Assumed Util.				<= Cap Assumed Util.				<= Cap Assumed Util.		
vsl03	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**	25% Mkt	Limit of	**90%**	**65%**
03-RoRo Med 24kt	Capture	90%	Util	Utili	Capture	90%	Util	Utili	Capture	90%	Util	Utili
Own&Oper Cost	447.8	447.8			538.4	538.4			447.8	447.8		
Fuel Cost	334.8	334.8			393.0	393.0			327.5	327.5		
Port Call Cost	119.5	119.5			125.7	125.7			125.7	125.7		
Total Cost/Voy	902.1	902.1			1057.2	1057.2			901.0	901.0		
Voy Duration	7.0	7.0			7.0	7.0			7.0	7.0		
Ships Deployed	2.0	2.0			2.0	2.0			2.0	2.0		
Voy/wk	2.0	2.0			2.0	2.0			2.0	2.0		
Vessel Service Cost/wk	1804.2	1804.2			2114.4	2114.4			1802.1	1802.1		
Service Mgmnt/wk	60.0	60.0			60.0	60.0			60.0	60.0		
Subtotal - FixedCost/wk	1864.2	1864.2	1864.2	1864.2	2174.4	2174.4	2174.4	2174.4	1862.1	1862.1	1862.1	1862.1
1-way Cap/Voy (100%)	255	255	255	255	255	255	255	255	255	255	255	255
1-way Cap/wk (100%)	510	510	510	510	510	510	510	510	510	510	510	510
SB Lds/wk	728	718	718	593	728	718	718	593	910	900	900	775
NB Ld/wk	578	548	548	418	578	548	548	418	722	692	692	562
Total Lds/wk	1,306	1,266	1,266	1,011	1,306	1,266	1,266	1,011	1,632	1,592	1,592	1,337
SB Handling $/wk	327.0	322.5	319.1	266.0	327.0	322.5	319.1	266.0	327.0	322.5	319.1	266.0
NB Handling $/wk	271.0	256.3	246.2	190.9	271.0	256.3	246.2	190.9	271.0	256.3	246.2	190.9
HMT/wk 50	65.3	63.3	63.3	50.5	65.3	63.3	63.3	50.5	81.6	79.6	79.6	66.8
Subtotal VarCost/wk ($000s)	663.3	642.1	628.5	507.4	663.3	642.1	628.5	507.4	625.9	658.4	644.8	523.7
Avg Var Cost / Load	*508*	*507*	*497*	*502*	*508*	*507*	*497*	*502*	*384*	*414*	*405*	*392*
Grand Total Costs/wk ($000s)	**2,528**	**2,506**	**2,493**	**2,372**	**2,838**	**2,816**	**2,803**	**2,682**	**2,488**	**2,520**	**2,507**	**2,386**
SB Rev $/wk	445.7	516.7	568.8	437.8	445.7	516.7	568.8	437.8	589.4	647.5	699.6	568.6
NB Rev $/wk	306.3	380.3	418.1	308.9	306.3	380.3	418.1	308.9	421.2	479.9	517.7	408.5
SubTotal Rev/wk ($000s)	**752.0**	**897.1**	**986.9**	**746.8**	**752.0**	**897.1**	**986.9**	**746.8**	**1,010.6**	**1,127.4**	**1,217.2**	**977.1**
Net Result ($000s / wk)	**(1,776)**	**(1,609)**	**(1,506)**	**(1,625)**	**(2,086)**	**(1,919)**	**(1,816)**	**(1,935)**	**(1,477)**	**(1,393)**	**(1,290)**	**(1,409)**
Cost/Load Handled	*($1,936)*	*($1,981)*	*($1,970)*	*($2,347)*	*($2,174)*	*($2,226)*	*($2,215)*	*($2,654)*	*($1,525)*	*($1,584)*	*($1,575)*	*($1,785)*
Rev/Load	*$576*	*$709*	*$780*	*$739*	*$576*	*$709*	*$780*	*$739*	*$619*	*$708*	*$765*	*$731*
Net/Load	*($1,360)*	*($1,272)*	*($1,190)*	*($1,608)*	*($1,598)*	*($1,517)*	*($1,435)*	*($1,915)*	*($905)*	*($875)*	*($810)*	*($1,054)*

Distribution of Costs - Opt 2, Vessel 21

VesselCapital $/day	$44,760
Crew & Oper. $/day	$19,210
$/day	$63,970
$/Voy	$447,790
$/week/vsl	$447,790
$/week	$895,580

Cost per week												
Vessel Capital	626.6	626.6	626.6	626.6	807.94	807.9	807.9	807.9	626.64	626.6	626.6	626.6
Vessel Crew & Operating	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9	268.9
Fuel	669.6	669.6	669.6	669.6	786.0	786.0	786.0	786.0	655.0	655.0	655.0	655.0
Port Call Cost	239.1	239.1	239.1	239.1	251.4	251.4	251.4	251.4	251.4	251.4	251.4	251.4
Service Management	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Subtotal Vessel	1,864.2	1,864.2	1,864.2	1,864.2	2,174.4	2,174.4	2,174.4	2,174.4	1,862.1	1,862.1	1,862.1	1,862.1
Handling	598.0	578.8	565.3	456.9	598.0	578.8	565.3	456.9	598.0	578.8	565.3	456.9
HMT	65.3	63.3	63.3	50.5	65.3	63.3	63.3	50.5	81.6	79.6	79.6	66.8
Total Costs/week	2,527.5	2,506.3	2,492.8	2,371.6	2,837.6	2,816.5	2,802.9	2,681.8	2,541.6	2,520.5	2,506.9	2,385.8

% of Weekly Costs												
Vessel Capital	24.8%	25.0%	25.1%	26.4%	28.5%	28.7%	28.8%	30.1%	24.7%	24.9%	25.0%	26.3%
Vessel Crew & Operating	10.6%	10.7%	10.8%	11.3%	9.5%	9.5%	9.6%	10.0%	10.6%	10.7%	10.7%	11.3%
Fuel	26.5%	26.7%	26.9%	28.2%	27.7%	27.9%	28.0%	29.3%	25.8%	26.0%	26.1%	27.5%
Port Call Cost	9.5%	9.5%	9.6%	10.1%	8.9%	8.9%	9.0%	9.4%	9.9%	10.0%	10.0%	10.5%
Service Management	2.4%	2.4%	2.4%	2.5%	2.1%	2.1%	2.1%	2.2%	2.4%	2.4%	2.4%	2.5%
Subtotal Vessel	73.8%	74.4%	74.8%	78.6%	76.6%	77.2%	77.6%	81.1%	73.3%	73.9%	74.3%	78.0%
Handling	23.7%	23.1%	22.7%	19.3%	21.1%	20.6%	20.2%	17.0%	23.5%	23.0%	22.5%	19.2%
HMT	2.6%	2.5%	2.5%	2.1%	2.3%	2.2%	2.3%	1.9%	3.2%	3.2%	3.2%	2.8%
Total Costs/week	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

APPENDIX L: INTERNATIONAL, FEDERAL AND STATE ENVIRONMENTAL COMPLIANCE REQUIREMENTS

The following appendix presents details of the marine environment regulations likely to apply to the establishment and operation of the ECMH. Regulations that may pertain to specific cargoes are discussed and a brief overview of land-based regulations that would likely apply should landside development be required or induced in the future.

Based on the results of the market analysis, it is assumed that port-specific capital improvements would not occur until M-95 Corridor services have become well established. General reviews of environmental regulations and permits that may be associated with port specific capital improvements are provided herein for informational purposes and to facilitate future planning efforts.

KEY INTERNATIONAL ENVIRONMENTAL COMPLIANCE REQUIREMENTS

INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS (MARPOL 73/78)

MARPOL 73/78 (International Convention for the Prevention of Pollution from Ships) is the international treaty regulating disposal of wastes generated by normal operation of vessels. MARPOL 73/78 is implemented in the U.S. by the Act to Prevent Pollution from Ships, under the lead of the U.S. Coast Guard (USCG). 161 countries are parties to MARPOL 73/78 as of December 2001. The International Maritime Organization (IMO) in London performs Secretariat functions. Within IMO, environmental issues are responsibility of the Marine Environment Protection Committee. MARPOL was designed to minimize pollution of the seas, including dumping, oil and exhaust pollution. The objective of the treaty is to preserve the marine environment through the complete elimination of pollution by oil and other harmful substances and the minimization of accidental discharge of such substances. All ships flagged under countries that are signatories to MARPOL are subject to its requirements, regardless of where they sail.

NORTH AMERICAN AGREEMENT ON ENVIRONMENTAL COOPERATION (SIDE TREATY OF THE NORTH AMERICAN FREE TRADE AGREEMENT)

In coordination with the North American Free Trade Agreement (NAFTA), the North American Agreement on Environmental Cooperation (NAAEC) was enacted in 1994 as a North American regional effort promoting environmental law and enforcement. NAAEC requires high levels of environmental protection by each party, Canada, the U.S., and Mexico, and establishes a range of procedures and actions taken by a state to ensure compliance with laws or regulations, and where compliance is not met, ensures the enforcement of appropriate remedies for violations. Projects under the proposed marine highway would be assessed throughout the region to ensure compliance with the NAAEC, Article 2 provisions, whereby each party has made the following commitments (CEC 1993):

1. The federal government of each participating country shall, with respect to its territory:
   a) periodically prepare and make publicly available reports on the state of the environment;
   b) develop and review environmental emergency preparedness measures;
   c) promote education in environmental matters, including environmental law;
   d) further scientific research and technology development in respect of environmental matters;
   e) assess, as appropriate, environmental impacts; and

f) promote the use of economic instruments for the efficient achievement of environmental goals.

2. Each Party shall consider implementing in its law any recommendation developed by the Commission for Environmental Cooperation Council under Article 10(5) (b).

3. Each Party shall consider prohibiting the export to the territories of the other Parties of a pesticide or toxic substance whose use is prohibited within the Party's territory. When a Party adopts a measure prohibiting or severely restricting the use of a pesticide or toxic substance in its territory, it shall notify the other Parties of the measure, either directly or through an appropriate international organization.

KEY FEDERAL ENVIRONMENTAL COMPLIANCE REQUIREMENTS

Federal laws applicable to the establishment and operation of M-95 are aimed to manage and minimize adverse impacts to important resources such as air and water; to protect rare and commercially import species and habitats; to manage development in potentially hazardous areas; to safely manage hazardous substances and cargoes; and to protect to human population. Key federal regulations applicable to the implementation and operation of M-95 are described below.

RELATED TO MARINE HIGHWAY OPERATION

National Environmental Policy Act (42 USC 4321 et seq.)

The intent of NEPA is to consider impacts on the environment through informed federal decision making. The Council on Environmental Quality (CEQ) was established under NEPA to implement *Regulations for Implementing Procedural Provisions of the National Environmental Policy Act* (40 CFR 1500-1508). These regulations specify that an environmental assessment:

- briefly provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact;
- aid in an agency's compliance with NEPA when no EIS is necessary; and
- Facilitate the preparation of an EIS when one is necessary.

Under customary international law, U.S. Territory generally extends out into the ocean for a distance of 3 nautical miles (nm) (5.6 kilometers [km]) from the coastline. By Presidential Proclamation 5928, issued 27 December 1988, the U.S. extended its exercise of sovereignty and jurisdiction under international law to 12 nm (22 km). However, the Proclamation expressly provides that it does not extend or otherwise alter existing federal law or any associated jurisdiction, rights, legal interests, or obligations. The Proclamation thus did not alter existing legal obligations under NEPA.

In 1983, Presidential Proclamation 5030 established the 200-nm (370-km) zone off all U.S. coasts as the Exclusive Economic Zone (EEZ), declaring, "…to the extent permitted by international law…sovereign rights for the purpose of exploring, exploiting, conserving, and managing natural resources, both living and non-living, of the seabed and subsoil and the superadjacent waters." The assertion of jurisdiction) over the EEZ of the U.S. altered the legal basis for economic exploration and exploitation, scientific research, and protection of the environment by the U.S. As a matter of policy, National Oceanic Atmospheric Administration (NOAA) has elected to apply NEPA to the 200-nm (370-km) EEZ of the U.S. Therefore, should NOAA become a cooperating agency in the preparation of a NEPA document, potential impacts to areas within the 200-nm (370-km) boundary of the EEZ are subjected to analysis under NEPA.

Act to Prevent Pollution from Ships (33 USCS 1901)

The Act to Prevent Pollution from Ships is a U.S. federal law that was enacted to implement the provisions of MARPOL and the annexes to which the U.S is a party. The Act applies to all U.S. flagged ships all across the globe and to all foreign flagged vessels operating in navigable waters of the U.S. or while at port under U.S. jurisdiction.

Regulations needed to implement the Act are primarily prescribed and enforced by the USCG. The regulatory mechanism established in the Act to implement MARPOL is separate and distinct from the Clean Water Act (CWA) and other federal environmental laws.

Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (33 CFR 151.2035(a))

The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 is intended to identify and implement ways to prevent the unintentional introduction and spread of invasive species into waters of the U.S., to work toward minimizing economic and ecological impacts of established nonindigenous species, and to establish a program to assist states in the management and removal of such species. The Act directs the USCG to issue regulations to prevent the introduction and spread of aquatic invasive species into the Great Lakes and other U.S. waters through ballast water.

The USCG has issued the following voluntary guidelines (summarized below) for all vessels with ballast tanks operating on waters of the U.S. waters within the EEZ. Additional guidelines exist for those vessels traveling outside of the EEZ.

- Avoid ballast operations in or near marine sanctuaries, marine preserves, marine parks, or coral reefs.
- Avoid taking on ballast water:
    - with harmful organisms and pathogens, such as toxic algal blooms;
    - near sewage outfalls;
    - near dredging operations;
    - where tidal flushing is poor or when a tidal stream is known to be more turbid;
    - in darkness when organisms may rise up in the water column; and
    - in shallow water or where propellers may stir up the sediment.
- Clean ballast tanks regularly.
- Discharge minimal amounts of ballast water in coastal and internal waters.
- Rinse anchors during retrieval to remove organisms and sediments at their place of origin.
- Remove fouling organisms from hull, piping, and tanks on a regular basis and dispose of any removed substances in accordance with local, state, and federal regulations.
- Maintain a vessel-specific ballast water management plan.
- Train vessel personnel in ballast water management and treatment procedures.

Clean Air Act, Sections 101-131 (USC § 7401-7431)

The Clean Air Act (CAA) is the primary federal law that regulates airborne contaminants to protect the general public as well as the environment from exposure to harmful pollutants and promote healthy air quality. The U.S. Environmental Protection Agency (USEPA) has the authority under the CAA to implement and enforce regulations reducing air pollutant emissions, including setting limits on how much can be in the air anywhere in the U.S. Individual states or tribes typically take the lead in carrying out the CAA by often imposing more stringent limits, but they may not have weaker pollution limits than those set by the USEPA. Each state develops a State Implementation Plan that outlines how they will control air pollution under the CAA. While states and local agencies are responsible for all CAA requirements, Tribes may develop and implement only those parts of the CAA that are appropriate for their lands.

In addition to land-based mobile and stationary sources of emissions, ships are also significant contributors to mobile-source emissions. International standards were established regarding Emission Control Areas (ECAs) that require reduction in emissions of nitrogen oxides (NOx), sulfur oxides (SOx), and fine particulate matter (PM2.5). ECAs are currently in place for the North Sea and the Baltic Sea. A North American ECA was adopted that will begin in August 2012. The North American ECA requires ships to switch fuels when operating within up to 200 nm of the majority of U.S. and Canadian Atlantic and Pacific coastal waters, French territories off the Canadian Atlantic coast, the U.S. Gulf Coast, and the main, populated islands of Hawaii. The IMO amended the International Convention for the Prevention of Pollution from Ships designating the North American ECA.

Clean Water Act, Sections 301 and 401 (33 USC 1251 et seq.)

The CWA is the primary federal law that protects the nation's waters, including lakes, rivers, aquifers, and coastal areas. The primary objective of the CWA is to restore and maintain the integrity of the nation's waters. Jurisdictional waters of the U.S. are regulated resources and are subject to federal authority under Section 301. Jurisdictional waters of the U.S are broadly defined to include navigable waters (including intermittent streams), impoundments, tributary streams, and wetlands. Areas meeting the waters of the U.S. definition are under the jurisdiction of the U.S. Army Corps of Engineers (USACE). Any project that requires a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters is required to obtain a CWA Section 401 Water Quality Certification, verifying that the project activities would comply with state water quality standards.

Coastal Zone Management Act (16 USC 1451 et seq.)

The Coastal Zone Management Act requires that "any federal activity within or outside of the coastal zone that affects any land or water use or natural resource of the coastal zone" shall be "consistent to the maximum extent practicable with the enforceable policies" of a state's coastal zone management plan. Federal agencies, in carrying out their functions and responsibilities, are required to consult with, cooperate with, and, to the maximum extent practicable, coordinate their activities with other interested federal agencies.

Marine Mammal Protection Act (16 USC 1361 et seq.)

The Marine Mammal Protection Act (MMPA) of 1972 protects marine mammals by strictly limiting their "taking" in waters or on lands under U.S. jurisdiction, and on the high seas by vessels or persons under U.S. jurisdiction. The term "take," as defined in Section 3 (16 USC 1362) of the MMPA and its implementing regulations, means "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal." The term "harassment" was further defined in the 1994 amendments to the MMPA as any act of pursuit, torment, or annoyance, at two distinct levels:

- Level A Harassment – potential to injure a marine mammal or marine stock in the wild.
- Level B Harassment – potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavior patterns including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

The incidental, but not intentional, taking of marine mammals by U.S. citizens is allowed if certain findings are made and regulations are issued. The MMPA is administered and enforced by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS)

Marine Protected Areas

Executive Order (EO) 13158 defines Marine Protected Areas (MPAs) as areas where natural and/or cultural resources are given greater protection than the surrounding waters. In the U.S., MPAs span a range of habitats including the open ocean, coastal areas, inter-tidal zones, estuaries, and the Great Lakes. They also vary widely in purpose, legal authorities, agencies, management approaches, level of protection, and restrictions on human uses. The "official definition of an MPA as presented EO 13158 is, "...any area of the marine environment that has been reserved by federal, state, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein."

Two agencies are the primary managers of federal MPAs. The Department of Commerce/National Oceanic and Atmospheric Administration manages national marine sanctuaries, fishery management zones, and, in partnership with states, national estuarine research reserves. The Department of the Interior manages MPAs through national parks and national wildlife refuges. States, territories, and commonwealths also establish MPAs for various purposes. Each state and territory has various bureaus, departments, and divisions that regulate the environment, manage fisheries, manage lands, and regulate commerce.

Endangered Species Act (16 USC 1531 et seq.)

The Endangered Species Act (ESA) of 1973 and subsequent amendments provide for the conservation of threatened and endangered species of animals (including some marine mammals) and plants, and the habitats in which they are found. The ESA prohibits jeopardizing endangered and threatened species or adversely modifying critical habitats essential to their survival. Section 7 of the ESA requires consultation with NMFS and the USFWS to determine whether any endangered or threatened species under their jurisdiction may be affected by a proposed action. Generally, the USFWS manages land and freshwater species while NMFS manages marine species, including anadromous salmon. However, the USFWS has responsibility for some marine animals such as nesting sea turtles, walruses, polar bears, sea otters, and manatees.

Magnuson-Stevens Act (16 USC 1801-1882)

The Magnuson-Stevens Fishery Conservation and Management Act established U.S. jurisdiction from the seaward boundary of the coastal states out to 200 nm (370 kilometers [km]) for the purpose of managing fisheries resources. The Magnuson-Stevens Act is the principal federal statute that provides for the management of marine fisheries in the U.S. The purposes of the Magnuson-Stevens Act include: (1) conservation and management of the fishery resources of the U.S.; (2) support and encouragement of international fishery agreements; (3) promotion of domestic commercial and recreational fishing; (4) preparation and implementation of Fishery Management Plans; (5) establishment of Regional Fishery Management Councils ; (6) development of fisheries which are underutilized or not utilized; and (7) protection of Essential Fish Habitat (EFH). Federal agencies that authorize, fund, or undertake actions that may adversely affect EFH must consult with the Secretary of Commerce, through the NMFS, regarding potential effects to EFH, and NMFS must provide conservation recommendations.

National Marine Sanctuaries Act (16 USC 1431 et seq.)

The National Marine Sanctuaries Act authorizes the Secretary of Commerce to designate and protect areas of the marine environment with special national significance as national marine sanctuaries. Sanctuaries are administered by NOAA, Office of National Marine Sanctuaries. Regulations at 15 CFR Part 922 further implement the National Marine Sanctuaries Act and regulate the conduct of certain activities within sanctuaries; activities prohibited by regulation can only be undertaken by obtaining a permit. Section 304(d) of the National Marine Sanctuaries Act further

requires federal agencies to consult with NOAA before taking actions, including authorization of private activities, "likely to destroy, cause the loss of, or injure a sanctuary resource."

Right Whale Ship Strike Reduction Rule (50 CFR 224.105)

Vessels 65 feet or greater in length are required to slow down while operating in the U.S. Mid-Atlantic waters where North Atlantic right whales, a federally endangered species, are known to migrate, calve and nurse. All vessels 65 feet (19.8 meters) or longer must travel at 10 knots or less in coastal waters from Rhode Island to Georgia that are classified as Seasonal Management Areas to reduce the threat of ship collisions with critically endangered North Atlantic right whales. The 10-knot speed restriction extends out to 20 nm around major mid-Atlantic ports. The speed restriction also applies in waters off New England and the southeastern U.S., where whales gather seasonally.

The speed restrictions are based on the migration pattern of the whales. Slow moving North Atlantic right whales, among the most endangered whales in the world, are highly vulnerable to ship collisions, since their primary feeding and migration areas overlap with major East Coast shipping lanes.

The speed restrictions apply in the following approximate locations at the following times; they are based on times whales are known to be in these areas:

- Mid-Atlantic U.S. areas from Rhode Island to Georgia from November 1 to April 30.
- Southeastern U.S. from St. Augustine, Florida to Brunswick, Georgia from November 15 to April 15.
- Cape Cod Bay from January 1 to May 15.
- Off Race Point at northern end of Cape Cod from March 1 to April 30.
- Great South Channel of New England from April 1 to July 31.

In addition, NOAA and the USCG have developed and implemented Mandatory Ship Reporting Systems. The systems are endorsed by the IMO and require ships greater than 300 gross tons to report to a shore-based station when entering North Atlantic Right Whale Critical Habitat Mandatory Reporting Areas. In return, ships receive a message about right whales, their vulnerability to ship strikes, precautionary measures the ship can take to avoid hitting a whale, and locations of recent sightings.

Executive Order 13547—Stewardship of the Ocean, Our Coasts, and the Great Lakes

The National Ocean Council established the Interagency Ocean Policy Task Force, led by the Chair of the CEQ, to develop recommendations to enhance the nation's ability to maintain healthy, resilient, and sustainable oceans, coasts, and Great Lakes resources. In response to the Task Force recommendations, EO 13547 was signed on July 19, 2010. The recommendations included the following (CEQ 2010):

- Provide our Nation's first ever National Policy for the Stewardship of the Ocean, Our Coasts, and the Great Lakes.
- Provide a strengthened governance structure to provide sustained, high-level, and coordinated attention to ocean, coastal, and Great Lakes issues.
- Provide a targeted implementation strategy that identifies and prioritizes nine categories for action that the U.S. should pursue:
    1. Ecosystem-Based Management;
    2. Coastal and Marine Spatial Planning;
    3. Inform Decisions and Improve Understanding;
    4. Coordinate and Support federal, state, tribal, local, and regional management of the ocean, our coasts, and the Great Lakes;

5. Resiliency and Adaptation to Climate Change and Ocean Acidification;
6. Regional Ecosystem Protection and Restoration;
7. Water Quality and Sustainable Practices on Land;
8. Changing Conditions in the Arctic; and
9. Ocean, Coastal, and Great Lakes Observations, Mapping, and Infrastructure.

- Provide a framework for effective coastal and marine spatial planning that establishes a comprehensive, integrated, ecosystem-based approach to address conservation, economic activity, user conflict, and sustainable use of ocean, coastal, and Great Lakes resources.

EO 13547 supports the enhanced sustainability of ocean and coastal economies, preserves our maritime heritage, supports sustainable uses and access, provides for adaptive management to enhance our understanding of and capacity to respond to climate change and ocean acidification, and coordinates with our national security and foreign policy interests. EO 13547 provides for the development of coastal and marine spatial plans that build upon existing federal, State, tribal, local, and regional decision making and planning process. The proposed marine highway should comply with Council certified coastal and marine spatial plans, as described in the Final Recommendations and subsequent guidance from National Ocean Council.

Executive Order 12898 – Environmental Justice in Minority Populations and Low-Income Populations
EO 12898, federal Actions to Address Environmental Justice in Minority and Low-Income Populations, was issued to focus the attention of federal agencies on human health and environmental conditions in minority and low-income communities so that these populations are not disproportionately affected by federal actions.

Executive Order 13045 – Protection of Children from Environmental Health Risks and Safety Risks
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, was issued to ensure the protection of children. Federal agencies are required to identify and assess environmental health risks and safety risks that may disproportionably affect children.

RELATED TO CARGO POTENTIALLY ASSOCIATED WITH MARINE HIGHWAY OPERATION

Resource Conservation and Recovery Act (42 USC Part 6901)
In 1976, the Resource Conservation and Recovery Act (RCRA) was passed to govern the disposal of solid waste. It established the federal standards and requirements for state and regional solid waste authorities. RCRA provides a "cradle to grave" approach to solid and hazardous waste regulations. It regulates transportation and tracking of hazardous waste; establishes standards for storage and treatment by waste generators; provides an identifying procedure for hazardous waste; provides minimum technology standards for treatment, storage, and disposal facilities; provides for corrective action for historic solid and hazardous waste management units; establishes land disposal prohibitions and restrictions; regulates the installation, testing, and removal and remediation of underground storage tanks; regulates the management of used oil; and provides an enforcement mechanism.

RCRA was amended by the Federal Facilities Compliance Act of 1992 (PL 102-386, 106 STAT 1505), which provided a waiver of sovereign immunity with respect to federal, state, and local procedural and substantive requirements relating to the RCRA solid and hazardous waste laws and regulations at federal facilities.

Emergency Planning and Community Right-To-Know Act (42 USC 116)
The presence of Extremely Hazardous Substances in quantities at or above the Threshold Planning Quantity (TPQ) requires certain emergency planning activities to be conducted. The extremely

hazardous substances and their TPQs are listed in 40 CFR Part 355, Appendices A and B. For section 302 Extremely Hazardous Substances, Local Emergency Planning Committees must develop emergency response plans and facilities must notify the State Emergency Response Commission and LEPC if they receive or produce the substance on site at or above the Extremely Hazardous Substances TPQ. Additionally if the TPQ is met, facilities with listed Extremely Hazardous Substances are subject to the reporting requirements of Emergency Planning and Community Right-To-Know Act section 311 (provide material safety data sheet or a list of covered chemicals to the State Emergency Response Commission, Local Emergency Planning Committees, and local fire department) and section 312 (submit inventory form - Tier I or Tier II). The minimum threshold for section 311-312 reporting for Extremely Hazardous Substances is 500 pounds or the TPQ, whichever is less.

RELATED TO POTENTIAL PORT-SPECIFIC CAPITAL IMPROVEMENTS

Marine Protection, Research and Sanctuaries Act (Ocean Dumping Act) (P.L. 92-532)
The Marine Protection, Research, and Sanctuaries Act, also known as the Ocean Dumping Act, prohibits the dumping of material into the ocean that would unreasonably degrade or endanger human health or the marine environment.

Ocean dumping cannot occur unless a permit is issued under the Act. In the case of dredged material, the decision to issue a permit is made by the USACE, using USEPA's environmental criteria and subject to USEPA's concurrence.

The Act gives USEPA the responsibility for regulating the dumping of all materials except dredged material and provides for control of both the transportation of material to be dumped and the dumping itself. Banned entirely are the ocean disposal of radiological, chemical and biological warfare agents and high-level radioactive wastes.

Eleven ocean dumping sites in the Atlantic Ocean and the Gulf of Mexico are now used by approximately 100 permit holders for municipal and industrial wastes.

Rivers and Harbors Act, Section 10 (33 USC 401 et seq.)
Section 10 of the Rivers and Harbors Act of 1899 regulates structures or work in or affecting navigable waters of the U.S. Structures include any pier, wharf, bulkhead, etc. Work includes dredging, filling, excavation, or other modifications to navigable waters of the U.S. The USACE is authorized to issue permits for work or structures in navigable waters of the U.S.

National Historic Preservation Act (16 USC 470)
The National Historic Preservation Act (NHPA) requires that federal agencies allow the Advisory Council on Historic Preservation an opportunity to comment whenever their undertakings may affect resources that are listed, or potentially eligible for listing, on the National Register of Historic Places (NRHP). The NHPA also requires federal agencies to identify, evaluate, inventory, and protect NRHP resources (or resources that are potentially eligible for listing on the NRHP) on properties that they control. The governor of each state or territory appoints a State Historic Preservation Officer (SHPO) who is responsible for administering cultural resources programs within a given jurisdiction. Prior to the approval of an expenditure of any federal funds for an undertaking that may affect a NRHP resource; the federal action agency must initiate consultation procedures with the respective SHPO in accordance with NHPA.

Native American Graves Protection and Repatriation Act (PL 101-601)
The Native American Graves Protection and Repatriation Act requires each federal agency to summarize and inventory Native American cultural items in their collections; to identify lineal descendants and culturally-affiliated federally-recognized Indian tribes and Native Hawaiian organizations; and to repatriate the cultural items in consultation with the specified groups. Notification and consultation must occur prior to the intentional excavation of The Native American Graves Protection and Repatriation Act cultural items from archaeological sites or in case of their advertent discovery.

Executive Order 11988 – Floodplain Management
EO 11988, Floodplain Management, was issued to help avoid possible long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. EO 11988 requires that federal agencies establish and implement certain procedures to minimize development in floodplains and if such development is unavoidable to follow established design and construction guidelines.

Executive Order 11990 – Protection of Wetlands
EO 11990, Protection of Wetlands, was issued to help avoid possible long- and short-term adverse impacts associated with the destruction and modification of wetlands and to avoid direct or indirect support of development in wetlands wherever there is a practicable alternative. EO 11990 requires that federal agencies establish and implement procedures to minimize development in wetlands

Other laws
Section 404 of the Clean Water Act would be applicable to any port specific capital improvements that would involve dredging and or filling activities and a permit would be required. Should port improvements involve the addition of a large stationary emissions source a permit under the Clean Air Act may also be required.

SUMMARY OF KEY STATE ENVIRONMENTAL COMPLIANCE REQUIREMENTS

MASSACHUSETTS

RELATED TO MARINE HIGHWAY OPERATION

Massachusetts Oceans Act of 2008
The Massachusetts Ocean Act stipulates that the ocean management plan be implemented through existing state review procedures, with all licenses, permits, and leases required to be consistent to the maximum extent practicable with the plan.

- Requires that the plan be revised and publicly reviewed at least every five years.
- Establishes commercial and recreational fishing as allowed uses subject to the jurisdiction of the Division of Marine Fisheries.
- Allows for appropriate-scaled renewable energy development in ocean waters, provided such development is consistent with the ocean management plan.
- Establishes an Ocean Resources and Waterways Trust Fund (Trust Fund) to be funded by mitigation fees, grants, Legislative appropriations, and income from investments and used to restore or enhance marine habitat and resources or compensate for navigational impacts resulting from ocean development.

Finally, the Oceans Act includes several process-related provisions. The Act sets the schedule for plan development and promulgation, establishes requirements for formal public review, and provides for an Ocean Advisory Commission and Science Advisory Council to assist the Secretary of Energy and Environmental Affairs in developing the ocean management plan.

Massachusetts Ocean Management Program

The Oceans Act of 2008 specifically directs that the Massachusetts Ocean Management Plan:

- set forth the commonwealth's goals, citing priorities and standards for ensuring effective stewardship of its ocean waters held in trust for the benefit of the public; and
- adhere to sound management practices, taking into account the existing natural, social, cultural, historic and economic characteristics of the planning areas;
- preserve and protect the public trust;
- reflect the importance of the waters of the commonwealth to its citizens who derive livelihoods and recreational benefits from fishing;
- value biodiversity and ecosystem health;
- identify and protect special, sensitive or unique estuarine and marine life and habitats;
- address climate change and sea-level rise;
- respect the interdependence of ecosystems;
- coordinate uses that include international, federal, state and local jurisdictions;
- foster sustainable uses that capitalize on economic opportunity without significant detriment to the ecology or natural beauty of the ocean;
- preserve and enhance public access;
- support the infrastructure necessary to sustain the economy and quality of life for the citizens of the commonwealth;
- encourage public participation in decision-making;
- adapt to evolving knowledge and understanding of the ocean environment; and
- identify appropriate locations and performance standards for activities, uses and facilities allowed under the Ocean Sanctuaries Act, including but not limited to renewable energy facilities, aquaculture, sand mining for beach nourishment, cables, and pipelines.

The Massachusetts Ocean Management Plan was finalized and released on January 4, 2010, as required by the Massachusetts Ocean Act. The Ocean Plan is required by law to protect special, sensitive and unique marine resource areas while also promoting responsible ocean development, including renewable energy, in state ocean waters.

Massachusetts Endangered Species Act (MGL Chapter 131A)

The Massachusetts Endangered Species Act (M.G.L c.131A and regulations 321 CMR 10.00) protects rare species and their habitats by prohibiting the "take" of any plant or animal species listed as Endangered, Threatened, or Special Concern by the Massachusetts Division of Fisheries & Wildlife. "Take" is defined as, "in reference to animals to harass, harm, pursue, hunt, shoot, hound, kill, trap, capture, collect, process, disrupt the nesting, breeding, feeding or migratory activity or attempt to engage in any such conduct, or to assist such conduct, and in reference to plants, means to collect, pick, kill, transplant, cut or process or attempt to engage or to assist in any such conduct. Disruption of nesting, breeding, feeding or migratory activity may result from, but is not limited to, the modification, degradation or destruction of Habitat." Permits for taking rare species for scientific, educational, conservation, or management purposes can be granted by the Division of Fisheries & Wildlife.

Coordination with Division of Fisheries & Wildlife is required to identify whether any priority habitats occur in the area that could be affected by M-95 operations. Projects in priority habitat areas must be reviewed for Massachusetts Endangered Species Act compliance.

Massachusetts Clean Waters Act (MGL c. 21 s. 26-53)

The Massachusetts Clean Water Act essentially mirrors the federal CWA. The Act authorizes the Massachusetts Department of Environmental Protection (MassDEP) to adopt standards of minimum water quality and prescribe effluent limitations, permit programs and procedures applicable to the management and disposal of pollutants, including, where appropriate, prohibition of discharges. Pollutant is defined as: "Any element or property of sewage, agricultural, industrial or commercial waste, runoff, leachate, heated effluent, or other matter in whatever form, and whether originating at a point or nonpoint source, that is or may be discharged, drained or otherwise introduced into any sewage system, treatment works or waters of the Commonwealth".

Permits are required to discharge of pollutants into waters of the state and to construct, install, modify, operate or maintain an outlet for such discharge or any treatment works. The Act also provides for the establishment of water pollution abatement districts for the construction, acquisition, extension, improvement, maintenance and operation of a system of water pollution abatement facilities. The Act also requires MassDEP to administer programs for the preservation and restoration of the publicly-owned lakes and great ponds within the state and aquatic nuisance species control. MassDEP is authorized to establish "areas of special interest" within state waters, which include Buzzards Bay, Vineyard Sound and Mount Hope Bay, and issue rules and regulations to protect against oil spills.

Public Waterfront Act (MGL c. 91)

The oldest program of its kind in the nation, The Public Waterfront Act (Chapter 91) regulates activities on both coastal and inland waterways, including construction, dredging and filling in tidelands, great ponds and certain rivers and streams. Through Chapter 91, Massachusetts seeks to preserve and protect the rights of the public, and to guarantee that private uses of tidelands and waterways serve a proper public purpose. The Waterways Regulation Program, the section of the MassDEP that oversees Chapter 91, is the primary division charged with implementing the "public trust doctrine." Specifically, the MassDEP Waterways Regulation Program:

- Preserves pedestrian access along the water's edge for fishing, fowling and navigation and, in return for permission to develop non-water dependent projects on Commonwealth tidelands, provides facilities to enhance public use and enjoyment of the water.
- Seeks to protect and extend public strolling rights, as well as public navigation rights.
- Protects and promotes tidelands as a workplace for commercial fishing, shipping, passenger transportation, boat building and repair, marinas and other activities for which proximity to the water is either essential or highly advantageous.
- Protects Areas of Critical Environmental Concern, ocean sanctuaries and other ecologically sensitive areas from unnecessary encroachment by fill and structures.
- Protects the rights of waterfront property owners to approach their property from the water.
- Encourages the development of city and town harbor plans to dovetail local waterfront land use interests with the Commonwealth's statewide concerns.
- Assures removal or repair of unsafe or hazardous structures

Massachusetts Waterways Regulations

The general purposes served by the Massachusetts Waterways Regulations are to:

- protect and promote the public's interest in tidelands, Great Ponds, and non-tidal rivers and streams in accordance with the public trust doctrine, as established by common law and codified in the Colonial Ordinances of 1641-47 and subsequent statutes and case law of Massachusetts;
- preserve and protect the rights in tidelands of the inhabitants of the Commonwealth by ensuring that the tidelands are utilized only for water-dependent uses or otherwise serve a proper public purpose;
- protect the public health, safety, and general welfare as it may be affected by any project in tidelands, great ponds, and non-tidal rivers and streams;
- support public and private efforts to revitalize unproductive property along urban waterfronts, in a manner that promotes public use and enjoyment of the water; and
- foster the right of the people to clean air and water, freedom from excessive and unnecessary noise, and the natural, scenic, historic, and esthetic qualities of their environment under Article XCVII of the Massachusetts Constitution.

Massachusetts Port and Harbor Planning Program

The primary goals of the Massachusetts Office of Coastal Zone Management's (CZM) Port and Harbor Planning Program are to: (1) Help ensure that waterfront areas in the Commonwealth grow in a safe, environmentally sound, and economically prosperous manner; and (2) Balance potentially competing uses within a harbor or port to maximize public benefits.

Specific strategies include promoting meaningful public access to the water's edge and encouraging the creation or expansion of water-dependent facilities in developed port and harbor areas. This approach maximizes the value of these developed ports and ensures that businesses requiring close proximity to harbors, such as shipping, fish landings, and other marine-industrial uses, have a place to flourish on a sustainable basis. The success of these plans, however, often rests on the navigability of the ports, and therefore is closely linked to navigational dredging activities within these areas.

CZM has developed a set of regulations for the Review and Approval of Municipal Harbor Plans (301 CMR 23.00) that articulate the steps and standards that must be met for a harbor plan to be formally approved by the state. These steps and standards are necessary because state-approved harbor plans have the ability to modify certain dimensional and use standards and guide the application of other requirements within the state's Chapter 91 Waterway Licensing Regulations (310 CMR 9.0). Many of the major ports in Massachusetts, including Boston, New Bedford/Fairhaven, Fall River, Salem, and Gloucester, have either completed a state-approved harbor plan or are in the process of developing one. CZM also provides assistance and guidance for less-formal harbor planning activities to address community needs.

Global Warming Solutions and Green Communities Act (MGL c. 21N)

Global Warming Solutions Act requires the Commonwealth to:

- Establish regulations requiring reporting of GHG emissions by the Commonwealth's largest sources by January 1, 2009. These reports will provide important data about the actual types and levels of GHG emissions in the Commonwealth.
- Establish a baseline assessment of statewide GHG emissions in 1990, which will be used to measure progress toward meeting the emission reduction goals of the Act. The Legislature chose 1990 as the base year for these measurements because it is the base year used by many local, state and international climate agreements (including the Kyoto Protocol).

- Develop a projection of the likely statewide GHG emissions for 2020 under a "business as usual" scenario that assumes that no targeted efforts to reduce emissions are implemented. This projection estimates the levels of GHG emissions that will come from Massachusetts sources if no government action is implemented to require reductions, and will be used to analyze the extent of emission reductions that will be required to achieve the 2020 target established in the Act.
- Establish target emission reductions that must be achieved by 2020, and a plan for achieving them. The Global Warming Solutions Act requires that these must be established by January 1, 2011.
- Through an advisory committee, analyze strategies and make recommendations for adapting to climate change. The Global Warming Solutions Act requires that the committee reports to the Legislature by December 31, 2009.

The Green Communities Act promotes a dramatic expansion in energy efficiency, supports the development of renewable energy resources, creates a new greener state building code, removes barriers to renewable energy installations, stimulates technology innovation, and helps consumers reduce electric bills.

The ECMH should not be counterproductive to the achievement of established target emissions reductions and must be compliant with statewide GHG limits.

Massachusetts Clean Air Act (M.G.L. 111, §§ 142A-142J: Massachusetts Clean Air Act; 310 CMR 7.00: Air Pollution Control)

The Massachusetts Air Program has been developed in conformance with the federal CAA and its amendments and is administered by MassDEP. MassDEP must give a pre-construction operating permit for any large, stationary source of air pollution. All new sources of emissions must be consistent with the State Implementation Plan and the National Ambient Air Quality Standards.

Based on the amount of emission and category of emission source, an applicant may seek a Limited Plan approval, a Non-major Comprehensive Plan approval, or a Major Comprehensive Plan approval from MassDEP.

Massachusetts Coastal Management Program

The Massachusetts Coastal Management Program consists of 20 enforceable program policies and nine management principles governing activities within the coastal zone. The Massachusetts coastal zone roughly includes all land within a half-mile of coastal waters and salt marshes as well as all islands. The CZM within the Executive Office of Environmental Affairs is the lead for coastal policy and technical assistance in the state. The Coastal Program works closely with a network of agencies to implement the program.

Coastal Program staff also work closely with local governments and organizations to promote coastal management at the local level. While CZM is not a permitting agency, it does have the authority to review federal activities in the Massachusetts coastal zone to ensure that they are consistent with CZM enforceable policies. In addition, CZM reviews proposed projects that may have an impact to the coastal zone, when a proponent files with the Massachusetts Environmental Policy Act Unit or if the proponent submits an application to a state agency, such as MassDEP, for a state permit or license. Working with the appropriate state agency, CZM provides comments on the project, promoting the use of Low Impact Development in site design, to ensure consistency with water quality and growth management policies.

Related To Cargo Potentially Associated with Marine Highway Operation

Massachusetts Hazardous Waste Management Act (MGL c. 21C)
The MassDEP administers the Hazardous Waste Management Act M.G.L. Ch. 21C and its implementing regulations 31 CMR 30.00, which are more stringent than the RCRA hazardous material handling requirements. Massachusetts regulates the collection, transportation, separation, recovery, and disposal of solid and hazardous materials. Hazardous materials are defined as ignitable, corrosive, reactive, and/or toxic. Regulatory requirements for shipping and storage differ, depending on the amount and type of hazardous material generated.

All generators of hazardous waste are responsible for its proper disposal. RCRA requires a national "cradle to grave" tracking system for hazardous waste. In Massachusetts, every shipment of hazardous waste by a large or small quantity generator must be transported by a licensed hauler and sent to a licensed treatment, storage, or disposal facility, or a permitted recycling facility, and must be accompanied by a Uniform Hazardous Waste Manifest.

Massachusetts Oil and Hazardous Material Release Prevention and Response Act (MGL c. 21E; 310 Mass. Code Reg. 40)
The Massachusetts Oil and Hazardous Material Release Prevention and Response Act regulates the transportation, storage, and disposal of oil and other hazardous waste in accordance with the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Oil Pollution Act, and CWA. The Act authorizes the Massachusetts Department of Environmental Protection to take or arrange for response actions whenever it has reason to believe that oil or hazardous material has been released or that there is a threat of release of oil or hazardous material. The Act establishes strict liability, with limited exceptions, for releases or threats of release. The Act also creates an Office of Brownfield Revitalization within the Governor's office.

Related To Potential Port-Specific Capital Improvements

Massachusetts Wetlands Protection Act (MGL Chapter 131, Section 40; 310 CMR 10.00: Wetlands Regulations)
The purpose of the Wetlands Protection Act is to protect Massachusetts wetlands resources and to ensure that the beneficial functions of these resources are maintained. Wetland resources are defined as any bank, freshwater wetland, coastal wetland, beach, dune, tidal flat, marsh or swamp bordering on the ocean, any estuary, creek, river, stream, pond, lake, or certified vernal pool; Land under any of the water bodies listed; Land subject to tidal action, coastal storm flowage, or flooding; and Riverfront areas in the Commonwealth of Massachusetts. The resources identified are protected because they fulfill the public interest to protect public and private water supply, protect fisheries, protect groundwater supply, provide flood control, protect land containing shellfish, prevent storm damage, protect wildlife habitat, and prevent pollution. These interests are protected by a "no net loss of wetlands" policy. Projects that affect wetlands are required to avoid impacts where possible, minimize unavoidable impacts, and mitigate for unavoidable impacts. Performance standards define the levels of environmental impacts that cannot be exceeded.

Projects proposed in wetlands resource areas or in the buffer zone around them must obtain a local Order of Conditions. Wetland resources include land under the ocean, coastal banks, coastal beaches and tidal flats, coastal dunes, barrier beaches, rocky intertidal, salt marshes, land under salt ponds, Designated Port Areas, land containing shellfish, and land on the banks of fish runs.

Designated Port Areas

The Wetlands Regulations at 310 CMR 10.26 state that Land under the Ocean (LUO) in Designated Port Areas (DPAs) is likely to be significant to marine fisheries, storm damage prevention and flood control. LUO in DPAs often serves to provide support for coastal engineering structures such as seawalls and bulkheads, which have replaced natural protection for upland areas from storm damage and flooding.

Projects affecting LUO in DPAs should not result in alteration of wave and current patterns so as to affect the stability of such structures.

Land Under the Ocean

LUO is defined as "... land extending from the mean low water line seaward to the boundary of a municipality's jurisdiction and includes land under estuaries," within the Wetlands Regulations at 310 CMR 10.25(2). LUO is significant to the protection of marine fisheries and projects which affect LUO shall not cause adverse effects by altering the bottom topography so as to increase storm damage or erosion of coastal beaches, banks, dunes, of marshes. They must, among other things, also have no adverse effects on marine fisheries or wildlife habitat caused by alterations in water circulation, destruction of eelgrass beds, alteration in the distribution of sediment grain size, changes in water quality, or alterations of shallow submerged lands with high densities of polychaetes, mollusks, or macrophytic algae.

Land Containing Shellfish

Land Containing Shellfish is defined as "... land under the ocean, tidal flats, rocky intertidal shores, salt marshes or land under salt ponds when any such land contains shellfish," within the Wetlands Regulations at 310 CMR 10.34(2). Land Containing Shellfish is found to be significant to the protection of marine fisheries, when such areas have been identified and mapped by the local conservation commission or by MassDEP in consultation with The Massachusetts Department of Marine Fisheries. Documentation required for this designation includes recording the density of shellfish, size of the area and the historical and current importance of the area to commercial and recreational fishing.

Rivers Protection Act (MGL c. 258, Acts of 1996)

The Rivers Protection Act, Chapter 258 of the Acts of 1996, protects nearly 9,000 miles of Massachusetts riverbanks - helping keep water clean, preserving wildlife habitat, and controlling flooding. The law creates a riverfront area that extends on both sides of rivers and streams.
A river is defined under this Act as "any natural flowing body of water that empties into any ocean, lake, or other river and that flows throughout the year. The definition includes all perennial rivers, including streams and brooks that flow throughout the year. Rivers end where they meet the ocean, a lake, or pond". Intermittent streams are not subject to the Rivers Protection Act.

The riverfront area is a 200-foot wide corridor on each side of a perennial river or stream, measured from the mean annual high-water line of the river. However, the riverfront area is 25 feet in the following municipalities: Boston, Brockton, Cambridge, Chelsea, Everett, Fall River, Lawrence, Lowell, Malden, New Bedford, Somerville, Springfield, Winthrop, and Worcester; and in "densely developed areas," designated by the Secretary of the Executive Office of Environmental Affairs. Riverfront areas may contain wetlands and floodplains, as well as what have traditionally been considered upland areas. As a result, the features of the riverfront area vary by location: from asphalt and landscaped greenways in urban areas to woods, lawns, and farm fields in suburban and rural areas. Riverfront areas protect water quality, stabilize stream banks, reduce flood peaks and downstream flooding, support fish and wildlife habitat, and protect groundwater. Even in urban

settings, riverfront areas may provide flood control, storm damage prevention, and wildlife travel corridors.

Work in the riverfront area is not prohibited, but it must demonstrate that the project has no practicable alternatives and will have no significant adverse impacts. Existing structures such as single-family homes and accessory uses are exempt from the Rivers Protection Act.

Massachusetts General Laws Chapter 9, sections 26-27C.

Any projects that require funding, licenses, or permits from any state agency must be reviewed by the Massachusetts Historical Commission in compliance with Massachusetts General Laws Chapter 9, sections 26-27C. This law creates the Massachusetts Historical Commission, the office of the State Archaeologist, and the State Register of Historic Places among other historic preservation programs. It provides for Massachusetts Historical Commission review of state projects, State Archaeologist's Permits, the protection of archaeological sites on public land from unauthorized digging, and the protection of unmarked burials. These regulations set up a process that mirrors the federal "Section 106" regulations: identification of historic properties; assessment of effect; and consultation among interested parties to avoid, minimize, or mitigate any adverse effects.

Massachusetts General Law Chapter 6, sections 179-180, and Chapter 91, Section 63

Under Massachusetts General Law Chapter 6, sections 179-180, and Chapter 91, Section 63, the Massachusetts Board of Underwater Archaeological Resources is charged with the responsibility of encouraging the discovery and reporting, as well as the preservation and protection, of underwater archaeological resources. The Board's jurisdiction extends over both the inland and coastal waters of the state. Any shoreline alterations, dredging or in-water construction would be coordinated with the Massachusetts Board of Underwater Archaeological Resources.

Massachusetts Community Preservation Act (MGL. c. 44B)

The Community Preservation Act (CPA) is a smart growth tool that helps communities preserve open space and historic sites, create affordable housing, and develop outdoor recreational facilities. CPA also helps strengthen the state and local economies by expanding housing opportunities and construction jobs, and by supporting the tourism industry through preservation of historic and natural resources.

CPA allows communities to create a local Community Preservation Fund for open space protection, historic preservation, affordable housing and outdoor recreation. Community preservation monies are raised locally through the imposition of a surcharge of not more than 3% of the tax levy against real property, and municipalities must adopt CPA by ballot referendum.

The CPA statute also creates a statewide Community Preservation Trust Fund, administered by the Department of Revenue, which provides distributions each October to communities that have adopted CPA. These annual disbursements serve as an incentive for communities to pass CPA. New Bedford has not adopted CPA.

Massachusetts Coastal Estuarine Land Conservation Program

The Coastal and Estuarine Land Conservation Program (CELCP) was established by Congress in 2002 "for the purpose of protecting important coastal and estuarine areas that have significant conservation, recreation, ecological, historical, or aesthetic values, or that are threatened by conversion from their natural or recreational state to other uses," giving priority to lands that can be effectively managed and protected and that have significant ecological value. Congress directed NOAA to administer this program and to establish guidelines that would make CELCP project selection an objective and nationally competitive process. To meet this directive, NOAA developed

CELCP guidelines that require states wanting to participate in this voluntary program to first prepare a Coastal and Estuarine Land Conservation Plan (CELC Plan).

Massachusetts CZM drafted a state CELC Plan on behalf of the Executive Office of Energy and Environmental Affairs, with close cooperation with the Energy and Environmental Affairs Director of Land Policy and Division of Conservation Services. The Massachusetts Department of Conservation and Recreation, Massachusetts Department of Fish and Game, and the USFWS also participated extensively in developing the plan, and several major non-governmental land conservation organizations also reviewed and commented on the state's plan. The CELC Plan used many existing statewide planning efforts, such as the Statewide Land Conservation Plan, the BioMap Report, and the Living Waters Report as building blocks, while adding new information and screening strategies. CZM submitted the Massachusetts CELC Plan to NOAA and it was formally approved by NOAA's Office of Ocean and Coastal Resource Management on February 8, 2008.This plan is expected to be in place for approximately five years, and will help guide the state's selection of priority coastal and estuarine land conservation projects during this time.

NEW JERSEY

RELATED TO MARINE HIGHWAY OPERATION

New Jersey Water Quality Planning Act (N.J.A.S. 58:11A-1 to 16)
The New Jersey Water Quality Planning Act (WQPA) governs water quality planning and specifies the function, powers, and duties of the New Jersey Department of Environmental Protection (NJDEP), county governments, and certain area wide planning agencies. The purpose of the WQPA is to restore and maintain the chemical, physical, and biological integrity of the waters of the state including groundwater. Area wide water quality management plans are proposed by the WQPA to better manage water resources from a broader base and to better protect their purity and quality. The WQPA establishes that the people of the state have a paramount interest in the restoration, maintenance, and preservation of the quality of the waters of the state for the protection and preservation of:

- Public health and welfare;
- Food supplies;
- Public water supplies;
- Propagation of fish and wildlife;
- Agricultural and industrial uses;
- Aesthetic satisfaction;
- Recreation; and
- Other beneficial uses.

The WQPA establishes that the severity of the water pollution problem necessitates continuing water quality management planning in order to develop and implement water quality programs in concert with other social and economic objectives. Pollution abatement programs under the WQPA are designed to consider natural and man-made conditions because water quality is dependent upon many factors including topography, hydrology, population concentration, industrial and commercial development, agricultural uses, transportation, and other factors that vary among and within the different watersheds and various regions of the state.

The ECMH would ensure its operation would not adversely affect water quality under the WQPA.

New Jersey Air Pollution Control Act (N.J. S.A. 26:2C-1 to 25.2)
The New Jersey Air Pollution Control Act addresses the control of air pollution. The term "air pollution" means the presence in the outdoor atmosphere of one or more air pollutants of such quantities and characteristics and duration as to be, or likely be, injurious to public welfare, health of human health, plant or animal life, or property or unreasonably interfering with the enjoyment of life and property.

The NJDEP has primary responsibility for air quality in New Jersey. The NJDEP administers the federal CAA and associated regulations along with the state Air Pollution Control Act and promulgates related rules and regulations after public hearings to enforce the air quality legislation.

All new sources of emissions associated with ECMH operations must be consistent with the state Air Pollution Control Act.

New Jersey Air Pollution Emergency Control Act (N.J. S.A 26:2C-25.1)
The state of New Jersey has an Air Pollution Emergency Act. The Act provides for emergency air pollution controls and supplements the Air Pollution Control Act. In particular, the Act establishes the use of emergency powers to prevent or minimize disasters of unforeseeable proportions when air pollution may at certain times and in certain places so seriously affect the health of the public and directly threaten the lives of large portions of the population. An air pollution emergency may be determined to exist by the Department of Health and Senior Services when air pollution in any county, locality, place, or other area constitutes an unreasonable and emergency risk to the health of those present. In order to bring the emergency powers into effect, the determination that an unreasonable and emergency risk exists must be communicated in writing with the factual findings of the determination to the governor, and upon being so advised, the governor, in turn, proclaims that an air pollution emergency exists. In the emergency area, the governor may issue orders to:

- Prohibit, restrict, or condition motor vehicle travel of every kind including trucks and buses;
- Prohibit, restrict, or condition the operation of retail, commercial, manufacturing, industrial, or similar activity;
- Prohibit, restrict, or condition the burning or other consumption of any type of fuel; and
- Prohibit, restrict, or condition any and all other activity within which contributes or may contribute to the air pollution emergency.

In the event of an emergency, the operation of M-95 may be restricted.

New Jersey Endangered Species Act (N.J. S.A. 23:2A-1 to 13)
Under the New Jersey' ESA, the NJDEP is charged with conducting investigations concerning wildlife in order to develop information relating to populations, distribution, habitat needs, limiting factors, and other biological and ecological data to determine management measures necessary for wildlife to continue to sustain themselves successfully. On the basis of these investigations, the NJDEP is charged with designing and developing these management programs.

Under the New Jersey ESA, the NJDEP is authorized to:

- Formulate and promulgate, adopt, amend, and repeal rules and regulations limiting, controlling, and prohibiting the taking, possession, transportation, exportation, sale, offering for sale, or shipment of any nongame species or any wildlife on the endangered species list;
- Conduct periodic inspections in order to determine compliance with wildlife rules and regulations;

- Charge and collect fees in an amount sufficient to cover the costs of the inspections and services performed;
- Establish conservation and management programs including acquisition of land or aquatic habitats for nongame and endangered species of wildlife;
- Appoint a committee of experts including persons actively involved in the conservation of wildlife to advise and assist the NJDEP in carrying out the intent of the ESA.

Coordination with NJDEP is required to identify and protected species that may be affected by the operation of M-95 and to avoid/minimize potential impacts.

RELATED TO CARGO POTENTIALLY ASSOCIATED WITH MARINE HIGHWAY OPERATION

New Jersey Spill Compensation and Control Act (N.J.S.A. 58:10-23.11)
In recognition of the risks associated with the storage and transport of petroleum products and hazardous materials, the New Jersey State Legislature has mandated that facilities storing large quantities of these substances take preventative measures to reduce the likelihood of an incident. These requirements include testing and inspection of storage tanks, training of employees, and emergency response planning. The Discharge Prevention Program established under the Act facilitates implementation of these requirements. Regulations related to reporting of chemical and petroleum discharges are also administered under this program.

Compliance with this Act would be necessary for cargoes and volumes that meet its requirements.

Toxic Catastrophe Prevention Act (NJAS 13:1-k19)
Facilities in the State of New Jersey where an Extremely Hazardous Substance may be present or generated at or above regulatory levels are subject to the Toxic Catastrophe Prevention Act, (N.J.S.A. 13:1K-19 et seq.) and the regulations arising from the Act as codified in N.J.A.C. 7:31. The Toxic Catastrophe Prevention Act program provides assistance to covered facilities, and verifies compliance with N.J.A.C. 7:31. The Program reviews and approves risk management plans developed under the regulation as part of compliance with State and federal accidental release prevention requirements.

Compliance with this Act would be necessary if Extremely Hazardous Substance at or above regulatory levels are present.

RELATED TO POTENTIAL PORT-SPECIFIC CAPITAL IMPROVEMENTS

Freshwater Wetlands Protection Act (N.J.S.A. 13:9B-1 et seq)
The Freshwater Wetlands Protection Act requires NJDEP to regulate virtually all activities proposed in the wetland, including cutting of vegetation, dredging, excavation or removal of soil, drainage or disturbance of the water level, filling or discharge of any materials, driving of pilings, and placing of obstructions. The most common type of freshwater wetlands permit is a general permit. General permits cover a limited number of very minor activities, such as: repair of existing structures, short roads or driveways, docks, utility lines, stream bank stabilization, and septic system repair.

Coastal Area Facility Review Act (N.J.S.A. 13:19)
The Coastal Area Facility Review Act area varies in width from a few thousand feet to 24 miles, measured straight inland from the shoreline. The law divides the Coastal Area Facility Review Act area into pieces or zones, and regulates different types of development in each zone. Generally, development activities in close proximity to water are more likely to be regulated. The Coastal Area

Facility Review Act law regulates almost all development activities involved in residential, commercial, or industrial development, including construction, relocation, and enlargement of buildings or structures; and all related work, such as excavation, grading, shore protection structures, and site preparation.

Waterfront Development Law (N.J.S.A. 12:5-3)

The Waterfront Development Law is a very old law, passed in 1914, that seeks to limit problems that new development could cause for existing navigation channels, marinas, moorings, other existing uses, and the environment. Any development in a tidally flowed waterway anywhere in New Jersey requires a Waterfront Development Permit. Examples of projects that need a Waterfront Development Permit include docks, piers, pilings, bulkheads, marinas, bridges, pipelines, cables, and dredging. For development outside of the Coastal Area Facility Review Act area, the Waterfront Development Law regulates not only activities in tidal waters, but also the area adjacent to the water, extending from the mean high water line to the first paved public road, railroad or survey-able property line. At a minimum, the zone extends at least 100 feet but no more than 500 feet inland from the tidal water body. Within this zone, NJDEP must review construction, reconstruction, alteration, expansion or enlargement of structures, excavation, and filling. However, this part of the law does not apply within the Hackensack Meadowlands Development District. The Waterfront Development Program exempts the repair, replacement or reconstruction of some legally existing docks, piers, bulkheads and buildings, if the structure existed before 1978 and if other conditions are met. Also, there are exemptions for certain single family homes and for small (5,000 square feet) additions to certain existing structures, if the single family home or structure is located more than 100 feet inland from the mean high water line.

The Wetlands Act of 1970 (N.J.S.A. 13:9A)

In New Jersey, coastal wetlands are protected by The Wetlands Act of 1970, (TWA). Specifically, the purpose of the coastal wetland legislation is to protect the vital and productive areas between the sea and the land known as the estuarine zone. This area protects the land from the force of the sea, moderates the weather, provides a home for water fowl, fish, and shellfish, and assists in absorbing sewage discharge by the rivers. Preserving the ecological balance of this area and preventing its further deterioration and destruction is necessary to promote public health, safety, and welfare and protect public and private property, wildlife, marine fisheries, and the natural environment.
The TWA establishes the mapping by the NJDEP of all tidal wetlands. These wetland maps are key to identifying which areas are governed by the TWA. The maps are filed in the county in which the wetland area is located.

Wetland activities regulated by the TWA include: draining; dredging; excavating or removing soil, mud, sand, gravel, or any other aggregate; depositing or dumping any rubbish or similar material or discharging liquid wastes; erecting structures; driving pilings; or placing obstructions whether or not the tidal ebb and flow is changed. All regulated activities are prohibited without a permit issued by the DEP authorizing the activity. Permit application results in notice being provided to all property owners of land within two hundred (200) feet of the wetland area in the application as well as electric and gas utilities. Any loss or disturbance of coastal wetland must be mitigated by the creation or restoration of a wetland at least the size of the area lost or disturbed.

Tidelands Act (N.J.S.A. 12:3)

Tidelands, also known as riparian lands, are all those lands now or formerly flooded by the mean high tide of a natural waterway. These lands are owned by the people of the State of New Jersey. As a result, permission from the State must be obtained to use these lands, in the form of a tidelands license, lease, or grant.

New Jersey Water Pollution Control Act (N.S.J.A. 58:10A-I et seq.)
Under the New Jersey Water Pollution Control Act (WPCA) and its amendments, NJDEP is charged with the responsibility to administer the federal CWA and the federal Safe Drinking Water Act as well as state water pollution control provisions in order to maintain, protect, and enhance the state's water quality. The WPCA addresses water pollution control, the authority of the NJDEP including rulemaking authority, the creation of a New Jersey Pollutant Discharge Elimination System permit program, and establishes penalties for violations of the act. The WPCA is intended to facilitate restoration and maintenance of unpolluted surface and groundwater of the state in order to protect water and the environment.

Capital improvements that affect stormwater or point source discharges to surface waters must comply with this act.

New Jersey Historic Preservation Regulations
New Jersey's archeological and historic preservation laws can be found in Title 13 of the New Jersey Statutes Annotated. Within Title 13, the Historic Sites Council is covered in Chapter 1B-15.108 et seq., the New Jersey Register of Historic Places is addressed in Chapter 1B-15.128 et seq., and the Prohibition against Archaeological Site Disturbance is found in Chapters 1L-10 and 1L-23. Management authority over archeological sites, including underwater sites, resides with several state offices in the New Jersey Department of Environmental Protection.

The Historic Preservation Office administers the State historic preservation program to identify, evaluate, and assess impacts to historic properties; provides technical assistance to agencies and the public; and provides professional review and comment for a number of the state's permitting programs including coastal regulation.

The Coastal Management Program develops coastal zone management rules including procedures for management of shipwrecks and historic and archeological resources in the coastal zone. The Division of Land Use Regulation reviews project proposals for federal consistency and compliance with the coastal zone management rules and administers programs for protection of freshwater wetlands, flood hazard areas, coastal permitting, and tidelands.

Relevant regulations for the Department of Environmental Protection are in Title 7 of the New Jersey Administrative Code. State Park Service Rules are in Chapter 2 et seq., New Jersey Register of Historic Places Rules are in Chapter 4-1 et seq., and Coastal Zone Management Rules are in Chapter 7E. Within Chapter 7E, shipwreck management is covered in §3.13 and historic and archeological resources in §3.36.

Under these laws and rules, the state of New Jersey is committed to enhancing the quality of life for its residents through the preservation and appreciation of the state's historic and archaeological resources.

Capital improvements associated with the ECMH must comply with the New Jersey Historic Preservation Regulations to preserve the state's historic and archaeological resources.

MARYLAND

RELATED TO MARINE HIGHWAY OPERATION

Chesapeake Bay Agreement
The most recent version of the Chesapeake Bay Agreement was signed and put into action in 2000. Signatories of the Bay Agreement are representatives for the Chesapeake Bay Commission, the states of Maryland, Virginia, and Pennsylvania, the District of Columbia, and the U.S. Federal Government.

The primary goal of the agreement is to improve water quality sufficiently to sustain the living resources of the Chesapeake Bay and its tidal tributaries, and to maintain that water quality into the future. The agreement has five sections containing commitments to protect and restore living resources, vital habitats, and water quality through sound land use by promoting stewardship and engaging communities throughout the 64,000 square mile watershed. The agreement is designed to build on past restoration actions and will continue all Bay Program commitments outlined in previous agreements or Executive Council directives.

Operation of M-95 should support the goals and commitments of the Agreement.

Coastal Zone Consistency/Coastal Zone Management Program
Section 307 of the Federal Coastal Zone Management Act of 1972, as amended, requires that proposed federal activities affecting a state's coastal zone be consistent, to the maximum extent practicable, with a state's federally-approved Coastal Zone Management Program (CZMP). Maryland's CZMP was approved in 1978 and established specific goals, objectives, and policies for the protection, preservation and orderly development of the state's coastal resources. Maryland's CZMP is a comprehensive and coordinated program, based on existing state laws and authorities. The following federal activities must comply with the section 307 Federal Consistency requirements: direct federal actions; federal licenses and permits; and federal assistance to state and local governments. All U.S. Army Corps of Engineers' Section 10 and Section 404 permits must be determined consistent with the state's CZMP.

Maryland's CZMP is referred to as a "networked" program, which means it is based on existing laws and authorities. For activities impacting wetlands, the Coastal Zone Consistency determination is issued as part of the state's wetlands authorization. For federal activities that do not require a state permit, the review and decision is made through the Wetlands and Waterways Program's Coastal Zone Consistency Division. Although MDE is responsible for the official Coastal Zone Consistency decision, the decision is often based partially or entirely upon the findings of a variety of agencies within the CZMP network, depending upon the nature of the proposed activity.

Other state agencies such as the Departments of Agriculture, Economic and Community Development, Environment, Transportation, Health and Mental Hygiene, and State Planning, also participate in the Program. Other organizations in the program are the coastal counties, the City of Baltimore, the Coastal Resources Advisory Committee, the Board of Public Works, and the local soil conservation districts. The program is only implemented in coastal counties, and the City of Baltimore.

The Program has two objectives that relate to non-tidal wetlands:

- To protect coastal terrestrial areas of significant resource value – areas having scenic, scientific, geologic, hydrologic, biological or ecosystem maintenance importance, such as

non-tidal wetlands, endangered species habitat, significant wildlife habitat, and wintering and resting areas of migratory birds

- To promote the maintenance of natural buffers along, and natural drainage ways feeding to coastal tributaries and estuarine waters, to minimize adverse environmental effects of coastal developments and activities.

Nongame and Endangered Species Conservation Act (Annotated Code of Maryland10-2A-01)
This Act is supported by regulations (Code of Maryland Regulations [COMAR] 08.03.08) which contain the official state Threatened and Endangered Species list. Secondarily, Maryland Department of Natural Resources' Fisheries Service maintains an official list of game and commercial fish species that are designated as threatened or endangered in Maryland (Code of Maryland Regulations 08.02.12).

The Wildlife and Heritage Division tracks the status of over 1100 native plants and animals that are among the rarest in Maryland and most in need of conservation efforts as elements of our state's natural diversity. Of these species, the Maryland Department of Natural Resources officially recognizes 659 species and subspecies as endangered, threatened, in need of conservation, or endangered extirpated. Only 37, or 3% of the total tracked species, are listed by the U.S. Fish and Wildlife Service as nationally endangered or threatened.

Coordination with Maryland department of natural Resources and Wildlife and Heritage Division is required to identify and protected species that may be affected by the operation of M-95 and to avoid/minimize potential impacts.

RELATED TO CARGO POTENTIALLY ASSOCIATED WITH MARINE HIGHWAY OPERATION

Standards Applicable to Transporters of Hazardous Waste (COMAR 26.13.04)
COMAR 26.13.04 requires all transporters of Certified Hazardous Substances (CHS) used for non-residential or those regulated by the Department of Agriculture may not transport a CHS to a facility within the state or from a source within the state unless the person obtains a certificate from the Department. CHS used for residential purposes is defined in the regulation as "those CHS used in a household or domestic situation, and normally discarded in small quantities in refuse and other household waste collected for disposal in conventional sanitary landfills". A CHS Hauler Certificate is required of persons engaged in transporting CHS. All vehicles or articulated transports, to a facility within the state or from a source within the state, must display prominently the vehicle certification sticker and carry a copy of the hauler certification in the vehicle at all times. The regulation also specifies the reporting and manifest requirements for transporters as well as training, handling, insurance and inspection requirements and fees.

RELATED TO POTENTIAL PORT-SPECIFIC CAPITAL IMPROVEMENTS

Areas of Critical State Concern
The Department of State Planning's enabling legislation, article 88C, requires designation of Areas of Critical State Concern. The Critical Areas are integrated into local Comprehensive Plans (The Planning Act, art.66B). They are accorded a special status and receive special attention, when dealing with otherwise permissible activities within their boundaries, or local planning.

The Office of Planning's definition of an Area of Critical State Concern is the following: An Area of State Critical Concern is a specific geographic area of the state which, based on studies of physical, social, economic and governmental conditions and trends, is demonstrated to be so unusual or

significant to the state that the Secretary designates it for special management attention to ensure the preservation, conservation, or utilization of its special values.

The State Office of Planning is responsible of administering The Area of Critical State Concern. Other state Agencies are consulted in the process and may assist at different levels of the program. The Office of Planning also consults local governments, considers their recommendations before the designation of Area of Critical State Concern.

The Areas of Critical State Concern are within four classes: 1) tidal wetlands, 2) non-tidal wetlands, 3) protection and enhancement of rail service and 4) special areas. The Department of State Planning has designated certain wetland areas of exceptional value in Maryland that should have special protection.

Capital improvements associated with M-95 would need to identify any Areas of Critical State Concern and comply with any requirements associated with them.

Baltimore County Code, Sec. 14-331 to 14-350

The County of Baltimore provides protection for buffers around streams, wetlands, and floodplains. A 75 foot buffer is in place around all use 1 streams, and a 100 foot buffer exists around use 3 or 4 streams. The County has also established a 25 foot buffer around wetlands, floodplains, and erodible slopes. Additionally, principle buildings must be 35 feet from a buffer.

Specifically pertaining to streams, the County prohibits the discharge of pollutants into streams including sewage, wastes, toxics, and high-temperature effluents.

The County also enforces the Critical Area law, providing a 100 foot buffer around all tidal wetlands.

Capital improvements associated with M-95 would need to identify any environmental buffers and comply with any requirements associated with them.

Chesapeake Bay Critical Area Law

In 1986, the state of Maryland approved the final regulation and guideline for the establishment of the Critical Area Commission, (Subtitle 8-1801-1816) and criteria for the Chesapeake Bay Critical Area Law (COMAR 14.15). The purpose of the law is to regulate activities within 1,000 feet of tidal waters of the Chesapeake Bay with the intent of improving the water quality and habitat in the Bay. The criteria require that local jurisdictions protect the hydrologic regime and water quality of wetlands by minimizing alterations to the drainage area, surface/subsurface flow of water, and overall water quality.

The following activities are allowed in non-tidal wetland only when they are 1) water-dependent or 2) of substantial economic benefit; and are necessary and unavoidable. Includes:

- Grading, filling, excavating
- Draining or flooding
- Removal of vegetation

The Critical Area Law required that local jurisdictions meet state standards by developing local programs by June 1988. Upon approval of the local program, the Commission may direct the local jurisdiction to enforce the regulations. Non-tidal wetlands in the Critical Area Law were initially not regulated under the state Non-tidal Wetlands Act. In 1993, the Maryland Non-tidal Wetlands Act

was amended to regulate non-tidal wetlands in the Critical Area. Most local jurisdictions amended their local programs to exclude regulation of non-tidal wetlands. However, some counties chose to continue regulating activities in wetlands in the Critical Area.

Local jurisdiction that chooses to regulate non-tidal wetlands in the Critical Area protects the wetlands by requiring a minimum 25-foot buffer and allowing activities that meet the conditions stated in Activities. Incidental non-tidal wetland protection also occurs through low density zoning, 100 foot stream and tidal wetland buffer, and overlap with other habitat protection areas.

Capital improvements associated with M-95 would need to identify any wetlands and comply with any requirements associated with them under this Act.

Tidal Wetlands Act and Program

In 1970, the Maryland General Assembly recognized that many wetlands had been lost or despoiled throughout the state by unregulated activities such as dredging, dumping and filling, and that remaining wetlands were in jeopardy. The assembly established the Tidal Wetlands Act, which restricts construction and development actions in tidal wetlands.

The enactment of the Wetlands Act established a comprehensive plan to restrict and regulate activities conducted in wetlands in order to preserve and protect them. The Act states that these unregulated activities will "affect adversely, if not eliminate entirely, the value of the wetlands as a source of nutrients to finfish, crustacean, and shellfish of significant economic value" and will "destroy the wetlands as a habitat for plants and animals of significant economic value and eliminate or substantially reduce marine commerce, recreation, and aesthetic enjoyment". The Act also declares: "It is the policy of the state, taking into account varying ecological, economic, developmental, recreational, and aesthetic values, to preserve the wetlands and prevent their despoliation and destruction."

The Act mandated the mapping of tidal wetlands and the creation of a regulatory program to protect the state's tidal wetland resources. Maryland developed 2,400 scale tidal wetland boundary maps (1" = 200') which delineate tidal wetlands boundaries and depict vegetation types. In addition, the resource was defined as either state or private tidal wetlands. State wetlands include all the open water and vegetated wetlands below mean high water, and are owned by the state of Maryland. Private wetlands include all tidal wetlands above the mean high water line and are in private ownership.

Tidal wetlands are managed to provide reasonable use while furnishing essential resource protection. Licenses, issued by the state's Board of Public Works based on recommendations from the Water Management Administration, are required for projects in state wetlands. The Board of Public Works is comprised of the Governor, the Comptroller of the Treasury, and the State Treasurer. Permits are issued directly by Water Management Administration for projects in private wetlands. A permit or license must be obtained before a person fills, dredges, or otherwise alters a tidal wetland. Typical projects include:

- Shoreline protection projects including marsh creation, stone revetments, and bulkheads;
- Piers;
- Dredging; and
- Stormwater Discharges.

Construction of the following projects in tidal wetland areas require authorization from WMA: filling, dredging, bulkheads, revetments, boat ramps, jetties, cable crossings, storm drain systems,

groins, breakwaters, vegetative stabilization, and similar structures. Applications are evaluated to insure that appropriate steps are taken to first avoid, then minimize impacts to tidal wetlands. Mitigation is required for unavoidable impacts, with the amount of mitigation based on resources impacted, type of mitigation proposed, and location of the mitigation. In-kind and on-site mitigation is preferred and required wherever appropriate site conditions exist.

Capital improvements associated with M-95 would need to identify any wetlands and comply with any requirements associated with them under this Act.

Non-tidal Wetlands Protection Act and Program

The Non-tidal Wetlands Protection Act seeks to protect non-tidal wetlands by regulating and restricting all activities that could impact non-tidal wetlands or waters of the state. The Act also helps to insure "no net loss" in wetlands, by requiring mitigation or compensation for any wetland losses. The Act also has provisions for the structuring of a smooth and expedient application review process, for dealing with developments in wetlands.

Regulated activities include:

- Removal, excavation, or dredging of soil or materials of any kind.
- Changing existing drainage or flood retention characteristics.
- Disturbance of the water level or water table by drainage, impoundment, or other means.
- Filling, dumping, discharging of material, driving piles, or placing obstructions.
- Grading or removal of material that would alter existing topography.
- Destruction or removal of plant life.

Three aspects of Maryland law differ from federal regulation: isolated wetlands, the alteration of vegetation and hydrology, and regulation of a 25-foot buffer. Buffer requirements are expanded to 100 feet for "non-tidal wetlands of special state concern". These wetland areas are designated by regulation and mapped as having exceptional ecological or educational value of statewide significance.

The Non-tidal Wetlands Protection Act allows for delegation of all or part of the state program to local governments and provides for the development of watershed management plans. Watershed management plans, developed in accordance with the Non-tidal Wetlands Protection Act and the COMAR, can be used as the basis for regulatory decisions. The plans are developed in cooperation with local governments and specifically protect wetlands by incorporating them into a jurisdiction's land use decisions. To date, watershed plans have been adopted for the Big Annemessex River watershed in Somerset County and initiated in Baltimore, Calvert and Montgomery Counties.

Capital improvements associated with M-95 would need to identify any wetlands and comply with any requirements associated with them under this Act.

Waterway Construction Statute

Chapter 526 of the Laws of 1933, (legislation based on recommendations of the 1931 Commission), established a permanent state Water Resources Commission. The legislation reflected concern about deficiencies in the policies and programs of the state of Maryland with respect to water resources, including:

Measurement - "The number of gaging stations, the length of the term of such records, and the policy of location of stations have all been characterized by neither consistency nor plan."

Allocation of Water Resources - "The state has no plan either for the conservation or the development of its water resources, no agency for determining or recording rights or for the protection of recorded rights to the use of public waters by regulating diversions from them." Structures - "No agency exists with the delegated duty of inspecting, supervising, maintaining and operating all dams in so far as it is necessary to safeguard life and property."

The Water Resources Commission recognized that a manmade change to a stream or body of water in Maryland could diminish its course, current or cross-section. Today, waterway construction regulations assure that activities in a waterway or its floodplain, an area defined as waters of the state, do not create flooding on upstream or downstream property, maintain fish habitat and migration, and protect waterways from erosion. Authorization is required for construction or repair of the following projects in a waterway or a 100-year floodplain:

- Dams and reservoirs;
- Bridges and culverts;
- Excavation, filling or construction;
- Channelization;
- Changing the course, current or cross-section of any stream;
- Temporary construction (e.g. utility lines); or
- Any other similar project.

Construction activities in waters of the state are guided by both statute and regulation. Title 5, Subtitle 5 of the Environment Article, Annotated Code of Maryland, establishes an administrative procedure that promotes public safety and welfare. This administrative procedure is further described in COMAR 26.17.04. These regulations govern the construction, reconstruction, repair, or alteration of a dam, reservoir, or waterway obstruction or any change of the course, current, or cross section of a stream or water body within the state, including changes to the 100-year frequency floodplain of free flowing waters.

The requirements of both statute and regulation are combined in the permit application review process. During the evaluation of an application, an applicant may be required to address issues relating to:

- Safety, operation and maintenance of the structure;
- Ability of all on-site construction to withstand the impacts of the 100-year flood event;
- Flooding on adjacent properties;
- Erosion of the construction site or stream bank; and
- Environmental effects, such as the project's impacts on non-tidal wetlands, existing in-stream fisheries, wildlife
- habitat, or threatened or endangered species.

The issuance of a permit at the conclusion of the permit application review process indicates that the project adequately preserves the public safety, promotes the general public welfare, and protects in-stream resources.

Shore Erosion Control Program

The Shore Erosion Control Program provides technical assistance, relating to both structural and non-structural shoreline stabilization measures applicable to tidal shorelines and streambanks, to property owners, communities, local governments, businesses and others in need of information.

Technical assistance is provided through site evaluations, problem assessments and recommended solutions. Project planning and implementation by a property owner will require an understanding of alternative methods of protection, costs, maintenance needs, regulatory requirements, contracting and project management. Shore Erosion Control can assist in these areas through the expertise developed and reference materials available.

The owner of any property abutting a body of water in Maryland may file an application requesting assistance in the design, construction, management and financing of a streambank or shoreline erosion control project. Financial assistance for non-structural projects is awarded to the property owner by Shore Erosion Control in the form of short-term loans and matching grants. Agreements detail the requirements and extent of financial assistance, as follows:

- 75% interest-free loans for projects on private and public lands using state special funds.
- 75%-25% matching grants for projects on public lands using federal funds.

Capital improvements associated with M-95 may qualify for assistance under this program.

Stormwater Management

In 1982, legislation was passed to manage stormwater runoff to reduce stream channel erosion, pollution, and flooding to avoid adverse impact on land and water resources. Proposed changes to regulations were begun in 1993 and continue through 1999. Regulations are expected to be finalized in July 1999. A new stormwater design manual was released for review in 1998 and should be finalized in 1999.

Any land developed for residential, commercial, industrial, or institutional use requires an approved plan. Threshold of disturbance is 5000 square feet. State standards with mandatory local government implementation. Local ordinances under revised regulations shall be final in July 2000. Local programs are reviewed at least every three years.

Discharges must be treated prior to discharge in water or wetlands. The Department promotes establishment of wetland plantings in conjunction with wet pond facilities. Some indirect protection of wetlands through requirements to maintain streams in pre-development conditions. Treatment is required for one year storm event.

Maryland Historical Trust

The Maryland Historical Trust administers a variety of programs, including:

- The Maryland Inventory of Historic Properties– a list of all properties in the state that have been surveyed and recorded. However, just because a property has been surveyed and included in the Maryland Inventory of Historic Properties, it does not mean that it is historically significant or is subject to any restrictions or regulations.
- The Maryland and National Registers of Historic Places – The Maryland and National Registers are lists of properties that have been surveyed and evaluated and found to be historically significant the local, state, or national level.
- Financial Incentives – Maryland Historical Trust administers grants, loans, and tax credits for historic properties, including planning and documentation, “bricks and mortar”, museum, and heritage tourism projects.
- Review and Compliance – All state and federal agencies are required to consider the impact of their projects on historic properties. MHT reviews all projects receiving government assistance and helps agencies avoid, minimize, or mitigate adverse effects on historic properties.
- Archaeology – Maryland Historical Trust undertakes archeological research, coordinates public archeology programs, and monitors archaeological activities on state-owned property.

- Local Government and Community Assistance – Maryland Historical Trust provides technical and limited financial assistance to municipal and county governments, community organizations, and citizens on a variety of historic preservation policies and projects.
- Easements – Maryland Historical Trust holds easements on more than 600 historic properties across the state, including some of the most historically, architecturally, and archeologically significant properties in Maryland.

Many of these programs are administered in partnership with National Park Service and the Advisory Council on Historic Preservation.

FLORIDA

RELATED TO MARINE HIGHWAY OPERATION

Florida Water Resources Act of 1972 (FS 373)
The Florida Water Resources Act of 1972 established a form of administrative water law that brought all waters of the state under regulatory control. Five water management districts were formed, encompassing the entire state. Each district covers one or more important water basins. The five districts are the South Florida Water Management District, the Southwest Florida Water Management District, the St. John's River Water Management District, the Suwannee River Water Management District, and the Northwest Florida Water Management District.

Each district is controlled by a governing board of nine members who reside within the district, except the Southwest district, which has eleven board members. The members are appointed by the governor and confirmed by the Florida Senate to serve four-year terms.

The districts are required to implement regulatory programs for well construction, consumptive water use, and alterations to the management and storage of surface water. In addition to permitting authority, the districts have broad powers with respect to maintaining, regulating, altering, or constructing waterways and appurtenant facilities.

Statewide authority for water resource management was vested in the Florida Department of Environmental Regulation (FDEP) (which has since merged with the Department of Natural Resources by an act of the 1993 Florida Legislature to become the Department of Environmental Protection [DEP]).

Coordination with the appropriate Water Management Districts would be required to maintain the waterways associated with the ECMH.

The Air and Water Pollution Control Act (FS 403.011-403.44)
The Air and Water Pollution Control Act provides the FDEP with broad powers and duties to protect and improve water quality throughout the state. The FDEP classifies surface and groundwater bodies according to their most beneficial uses; establishes water quality criteria; develops standards of quality for wastewater discharges; and runs a permit system for operations that may pollute water (industrial plants, farms).

The purpose of the Florida Air and Water Pollution Control Act is to conserve, protect, and improve the quality of Florida's waters for a variety of purposes, including public water supplies and preservation of wildlife, and to achieve and maintain levels of air quality that will protect not only

human health and safety, but also plant and animal life and property in order to promote the social and economic development of Florida.

The FDEP is the primary enforcer of the Act, and is responsible for developing its rules and laws. The Act requires that FDEP make transcripts available for all Florida Air and Water Pollution Control Act proceedings.

Along with enforcement, FDEP has multiple duties under the Act, including the duties to:

- Approve and develop current and long-range plans to provide for air and water quality control and pollution abatement.
- Secure necessary scientific, technical, research, administrative, and operational services from other state agencies by interagency agreement, etc.
- Adopt a comprehensive program for the prevention, abatement, and control of pollution of the air and waters of Florida, and to review and modify this program as necessary.
- Take and test samples of air and water to determine the levels of air and water quality throughout Florida.
- Require persons engaged in operations that may result in pollution to file reports that may contain information relating to the rate and period of emission, and composition and concentration of contaminants.
- Establish a permit requirement system for the operation, construction, or expansion of any installation that may be the source of air or water pollution, and provide for the issuing and revocation of such permits (National Pollutant Discharge Elimination System [NPDES], Title V etc.).
- Consult with any person proposing to construct, install, or otherwise acquire a pollution control device or system concerning the effectiveness of such device or system, or the pollution problem related to the source, device, or system.
- Establish rules that provide for the special category of water bodies within the state, known as Outstanding Florida Waters, which are worthy of special protection because of their natural attributes.
- Coordinate Florida's stormwater program.
- Exercise the duties, powers, and responsibilities required of the state under the CAA.

Operation of M-95 would need to comply with the reporting requirements outlined under this Act in terms of the emission, and composition and concentration of contaminants that may be produced.

The Florida Environmental Land and Water Management Act of 1972 (FS 380.12 - 380.10)
This act created the Area of Critical State Concern Program, which establishes a procedure for increased protection of lands of statewide importance, including wildlife refuges, wilderness areas, and critical habitat of threatened or endangered species. The act also establishes the Development of Regional Impact Program, which requires that certain large-scale developments that impact more than one county must undergo more stringent development review, including review of the development's impact on wildlife habitat.

The ECMH must identify whether any Area of Critical State Concern would be affected by its operation.

Water Resource Implementation Rule (FAC 62-40)
The Florida Water Resources Implementation Rule is a set of adopted policies/rules that carry the weight of the law, mandating the implementation of elements of the Florida Water Plan. The

"Florida Water Plan: Implementing Watershed Management" released in 2001, is Florida's comprehensive statewide water resources plan, which updated the 1995 water plan. The Plan aims to ensure the long-term sustainability of Florida's water resources and associated natural systems in recognition of the importance of these systems to the state's economy, the quality of life of its citizens, and the survival of flora and fauna. The Plan provides the state with an underlying, conceptual framework.

The ECMH must demonstrate that it operation would protect and preserve the quality, quantity, and environmental values of surface water resources and prevent existing environmental, water quantity, and water quality problems from becoming worse.

Florida Surface Water Quality Standards (FAC62-302)
The federal CWA provides the statutory basis for state water quality standards programs. The regulatory requirements governing these programs (Water Quality Standards Regulation) are published in 40 CFR 131. States are responsible for reviewing, establishing, and revising water quality standards. Florida's surface water quality standards system is published in 62-302 (and 62-302.530) of the Florida Administrative Code. The components of this system include: classifications, criteria, including site specific criteria, an anti-degradation policy, and special protection of certain waters (Outstanding Florida Waters).

In response to recent initiatives put forth by the U.S. Environmental Protection Agency (EPA), Florida has been working to develop biological criteria and numeric nutrient criteria for fresh waters and estuaries.

The ECMH must demonstrate that it operation would not adversely affect water and would comply with applicable standards where they exist.

Florida Sovereignty Submerged Lands Management (FAC 18-20)
Sovereignty submerged lands include, but are not limited to, tidal lands, islands, sandbars, shallow banks and lands waterward of the ordinary or mean high water line, beneath navigable fresh water or beneath tidally-influenced waters.

The state of Florida acquired title to sovereignty submerged lands on March 3, 1845, by virtue of statehood. Sovereignty submerged lands include all submerged lands, title to which is held by the Board of Trustees (Governor and Cabinet) of the Internal Improvement Trust Fund.

The intent and purpose of this rule is:

- To aid in fulfilling the trust and fiduciary responsibilities of the Board of Trustees of the Internal Improvement Trust Fund for the administration, management and disposition of sovereignty lands.
- To ensure maximum benefit and use of sovereignty lands for all the citizens of Florida.
- To manage, protect, and enhance sovereignty lands so that the public may continue to enjoy traditional uses including, but not limited to, navigation, fishing and swimming.
- To manage and provide maximum protection for all sovereignty lands, especially those important to public drinking water supply, shellfish harvesting, aquaculture, public recreation, and fish and wildlife propagation and management.
- To ensure that all public and private activities on sovereignty lands which generate revenues or exclude traditional public uses provide just compensation for such privileges.
- To aid in the implementation of the State Lands Management Plan.

Operation of M-95 must receive authorization from The Board of Trustees of the Internal Improvement Trust Fund to use waters on or over submerged lands owned by the State. Activities and uses may be authorized by letter of consent, easement or lease, while some may qualify for consent by rule or an exception.

Florida Coastal Zone Management Program

The Florida Coastal Zone Management Program is a federally approved program under the federal Coastal Zone Management Act that provides federal funding support to assist states with managing coastal resources. In addition to providing funding, the Coastal Zone Management Act grants Florida the authority to review a broad range of federal actions for consistency with state law.

The Program is based on a network of agencies implementing 24 statutes that protect and enhance the state's natural, cultural and economic coastal resources. The goal of the program is to coordinate local, state and federal agency activities using existing laws to ensure that Florida's coast is as valuable to future generations as it is today. Florida's Department of Environmental Protection is responsible for directing the implementation of the state-wide coastal management program.

Operation of M-95 must be consistent with the enforceable policies of the Florida Coastal Zone Management Program.

Air Pollution Control – General provisions (FAC 62-204)

The General Provisions establish the maximum allowable levels of pollutants in the ambient air, or ambient air quality standards, necessary to protect human health and public welfare. The provisions also establish the maximum allowable increases in ambient concentrations for subject pollutants to prevent significant deterioration of air quality in areas where ambient air quality standards are being met. It further specifies approved air quality monitoring and modeling methods.

The provisions also designate all areas of the state as attainment, nonattainment, or unclassifiable with respect to each pollutant for which ambient air quality standards have been adopted; further designates certain attainment and unclassifiable areas of the state as air quality maintenance areas for particular pollutants; classifies all areas of the state as Class I, Class II, or Class III for determining which set of prevention of significant deterioration (PSD) increments apply; and designates all attainment and unclassifiable areas of the state as one or more PSD areas for determining which pollutant-specific PSD baseline dates apply. This chapter also sets forth procedures for redesignating and reclassifying areas as above.

The FDEP adopted the provisions to identify the Florida State Implementation Plan required by USEPA pursuant to 40 C.F.R. Part 51; to set forth the public notice and hearing requirements that the FDEP will adhere to for making state Implementation Plan revisions; and to set forth the definitions, criteria, and procedures that the FDEP will use to review a federal agency's general conformity determination; and to adopt by reference an interagency memorandum of agreement that the FDEP will comply with to review any transportation conformity determination.
Lastly, the provisions adopt and incorporate by reference federal air pollution control regulations which are referenced in whole or in part throughout the FDEP's air pollution control rules.

All new sources of emissions associated with ECMH operations must be consistent with the Air Pollution Control General Provisions.

Florida Endangered and Threatened Species Act of 1977 (Section 379.2291, F.S.)
The Florida Endangered and Threatened Species Act of 1977 provides for research and management to conserve and protect threatened and endangered species as a natural resource. Responsibility for the research and management of upland, freshwater and marine species is given to the Florida Fish and Wildlife Conservation Commission. The act also encourages Florida Fish and Wildlife Conservation Commission to develop a public education program dealing with endangered and threatened species. The Florida statutes define endangered and threatened species and provide the state's intent to protect these species. Under statute, the intentional killing or wounding of a listed species incurs a third degree felony. The statutes also provide a reward program for the arrest and conviction of those who violate state endangered species laws.

Coordination with Florida Fish and Wildlife Conservation Commission is required to determine whether protected species may be affected by the operation of M-95. A permit is required for take of any state listed species or any bird species protected by the federal Migratory Bird Treaty Act (MBTA).

RELATED TO CARGO POTENTIALLY ASSOCIATED WITH MARINE HIGHWAY OPERATION

Florida Hazardous Waste Rule (FAC 62-730)
Hazardous wastes must be recycled, treated, stored, or disposed at a proper hazardous waste facility and cannot be disposed on or in the ground, or in local landfills, septic tanks, or injection wells. Also, regardless of quantity, the generator of hazardous waste is ultimately responsible for the waste from "cradle to grave", and can be held liable for improper management of hazardous wastes.

February 12, 1985, Florida received authorization from the USEPA to administer its own hazardous waste management and regulatory program under RCRA of 1976. Florida received final authorization on November 17, 2000 to implement the Hazardous and Solid Waste Amendments of 1984. The most important feature of authorization is the state's agreement to issue permits that conform to the regulatory requirements of the law, to inspect and monitor activities subject to regulation, to take appropriate enforcement action against violators and to do so in a manner no less stringent than the federal program.

The Florida Hazardous Waste Regulation Section is responsible for implementing the hazardous waste regulatory portion of RCRA. It reviews and issues permits and coordinates compliance monitoring and enforcement activities at hazardous waste generators, transporters and Treatment, Storage and Disposal facilities with the regulatory District offices.

Any hazardous materials or wastes transported generated or stored as part of the ECMH would be subject to these regulations.

RELATED TO POTENTIAL PORT-SPECIFIC CAPITAL IMPROVEMENTS

Surface Water Improvement and Management Act (FS 373.451)
In 1987, the Florida Legislature created the Surface Water Improvement and Management program (SWIM) as one mechanism to address nonpoint pollution sources.

The state's five water management districts are directly responsible for the SWIM program and work in concert with DEP, federal, state, and local governments and the private sector. SWIM develops carefully crafted plans for at-risk water bodies, and directs the work needed to restore

damaged ecosystems, prevent pollution from stormwater runoff and other sources, and educate the public. SWIM plans are used by other state programs, like Save Our Rivers, to help make land-buying decisions, and by local governments to help make land-use management decisions. Twenty-nine water bodies are currently listed on the SWIM waterbody priority list.

Florida's east coast is under the jurisdiction of two water Management Districts; St. Johns River Water Management District and the South Florida Water Management District.

Capital improvements that increase stormwater runoff would be subject to the requirements of this Act.

Regulation of Stormwater Discharge (FAC 62-25)
Florida Administrative Code 62-25 regulates the discharge of untreated stormwater. FDEP enforces this rule to ensure that the designated most beneficial uses of watersare protected. Permits are required only for new stormwater discharge facilities and doesl not affect the FDEP authority to require appropriate corrective whenever existing facilities cause or contribute to violations of state water quality standards.

Capital improvements that increase stormwater runoff would be subject to these regulations.

Florida National Pollutant Discharge Elimination System Stormwater Program (FS 403.0885)
In October 2000, USEPA authorized the FDEP to implement the NPDES stormwater permitting program in the state of Florida (in all areas except Indian Country lands). The NPDES stormwater program regulates point source discharges of stormwater into surface waters of the state of Florida from certain municipal, industrial and construction activities. As the NPDES stormwater permitting authority, DEP is responsible for promulgating rules and issuing permits, managing and reviewing permit applications, and performing compliance and enforcement activities.

Capital improvements that increase or generate point sources of pollution would be subject to the requirements of this Act.

Florida's Impaired Waters Rule (FAC 62-303)
On May 3, 2001, the FDEP announced the adoption of the Identification of Impaired Surface Waters Rule, a new scientific approach for guiding the FDEP's process for identifying and prioritizing impaired surface waters in Florida. The rule evaluates whether waters meet their designated uses, which include aquatic life use support, primary contact and recreation use support, fish and shellfish consumption use support, and drinking water use support. Waters verified as not meeting any one (or more) of their designated uses will be listed on the state's 303(d) list. FDEP will develop TMDLs for all waters that are found to be impaired.

Florida's program is designed to ensure that the enormous costs associated with restoration of impaired waters is truly focused on degraded waters and where questions exist regarding the quality of selected waters, a process is established to provide timely assessment.

Capital improvements that result in point source discharges of pollutants to surface waters would be subject to the requirements of this Act.

Florida Watershed Restoration Act (FS 403.067)
The Florida Legislature enacted the Florida Watershed Restoration Act (FWRA) in 1999 to protect Florida's waters through the TMDL program for state ground and surface waters as required by the CWA. The TMDL program protects state waters by coordinating the control of pollution from point

sources (i.e., sources discharging through a discrete conveyance, such as a pipe, as well as urban stormwater conveyance outfalls) and nonpoint sources (i.e., sources contributing to pollution caused by rainfall moving over and through the ground). FWRA also establishes a process to identify and list impaired waters throughout the state.

TMDL is the total of the individual discharge allocations for point sources and the discharge allocations for nonpoint sources and natural background. In other words, TMDL is the total amount of pollution discharge from all sources that a water body can assimilate and still meet water quality standards. Furthermore, TMDL can also refer to a document that describes the discharge allocations. An implementation plan must be developed describing how the point and nonpoint sources are planning to meet their discharge allocations. Usually, this implementation plan is referred to as Basin Management Action Plan.

Capital improvements that increase or generate point sources of pollution would be subject to the requirements of this Act.

Warren S. Henderson Wetlands Protection Act of 1984 (FS 403.91-403.929)
The Henderson Act regulates activities involving the dredging and filling of wetlands, which includes most construction activities in or adjacent to wetlands. When determining whether to issue a permit under the Act, the agency must consider and balance a number of factors, two of which pertain directly to wildlife:

- First, whether the project will adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats.
- Second, whether the project will adversely affect the fishing or recreational values or marine productivity in the vicinity of the project.

Delineation of the Landward Extent of Wetlands and Surface Waters (FAC 62-301)
This rule's intent is to provide a unified statewide methodology for the delineation of the extent of wetlands and surface waters to satisfy the mandate of section 373.421, F.S. The delineation methodology is intended to approximate the combined landward extent of wetlands as determined by a water management district and the FDEP. The landward extent of wetlands is determined by the dominance of plant species, soils and other hydrologic evidence indicative of regular and periodic inundation or saturation. In all cases, the landward extent of wetlands is located visually by on-site inspection, or aerial photo interpretation in combination with ground truthing, without quantitative sampling. If this cannot be accomplished, the quantitative methods can be used unless the applicant or petitioner and regulating agency agree, in writing, on an alternative method for quantitatively analyzing the vegetation on site. The methodology cannot be used to delineate areas that are not wetlands or to delineate as wetlands or surface waters areas exempted from delineation by statute or agency rule.

Any wetlands affected by capital improvements must be identified via this delineation method.

Florida Historical Resources Act (FS 267.011)
Florida's antiquities law (Chapter 267, Florida Statutes), and administrative rules (Chapters 1A-31 and 1A-32) govern the use of publicly-owned archaeological and historical resources located on state property, both on land and in the water. Administered by the Florida Division of Historical resources, the law establishes programs and policies to encourage preservation of historic resources for the public benefit. State-owned underwater resources are those that are located on the bottom of navigable rivers, streams, lakes, bays, and offshore (in the Gulf of Mexico out to 10 miles, and in the Atlantic out to 3 miles).

Major goals of Florida's historic preservation program are to identify, register, protect, and preserve significant historical resources which belong to the public. Divers are encouraged to participate in the identification, recording, and reporting of underwater sites in order to preserve them. However, disturbing or digging of publicly-owned sites is illegal unless permission is obtained in advance from the Division of Historical Resources. Intentional excavation of underwater sites without written authorization is considered a third-degree felony.
Any dredging or in-water construction activity is subject to this regulation since underwater resources are those that are located on the bottom of navigable rivers, streams, lakes, bays, and offshore are considered state-owned property.

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USEPA, National Vehicle and Fuel Emissions Laboratory. Ms. Trish Koman, December 28, 2011.